

# PUBLIC HEALTH REPORTS

VOL. 41

JULY 16, 1926

NO. 29

## THE SO-CALLED ACTION OF ACID SODIUM PHOSPHATE IN DELAYING THE ONSET OF FATIGUE

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### Introduction

Emden's report (1) regarding the effects of acid sodium phosphate administered to German soldiers during the late war, to miners, and to animals, for the purpose of delaying the onset of fatigue, aroused considerable interest in the public mind. The study presented in this paper was prompted by the desire to determine, if possible, whether or not the results reported by Emden were generally applicable or were due to conditions peculiar to Germany and other European countries on account of the late war.

The position that phosphate occupies in the metabolism of the muscle has been investigated by various workers in the past. The production of an excess of acid sodium phosphate during exercise was suggested by Lee and others as being one of the factors in causing fatigue in the isolated muscle as indicated by a lowered muscular efficiency. MacLeod (1899) (2), studying the distribution of the inorganic and organic phosphate in the muscle of dogs exercised in a treadmill, found that there was a decrease in the water soluble organic phosphate with a corresponding increase in the inorganic phosphate. At a later date (1914) he was inclined to explain these results as being due to the action of the lactic acid, formed during exercise, on the organic compound.

Meigs (3), in discussing the function of inorganic phosphate in the physiology of striated muscle, suggests that the relaxation of the contracted muscle is brought about by the combining of the lactic acid with the potassium phosphate contained in the muscle fiber. That there is a relationship between the lactic acid and phosphoric acid in the muscle is apparently confirmed by the work of Emden and his school. They report that if the skeletal muscle of the dog is kept standing in bicarbonate at 40° C., phosphoric as well as lactic acid will be liberated, and, further, that under certain easily maintained experimental conditions the newly formed phosphoric acid is almost equimolecular with the newly formed lactic acid. On the basis of this evidence they were led to the conclusion that there is present in the muscle a special lactic acid forming substance, different from the usual carbohydrate, to which they have given the name "lactacidogen."

The reactions of this substance resemble very closely the reactions of hexophosphoric acid formed during alcoholic yeast fermentation. If any one of the carbohydrates is added to pressed muscle juice there is no increase in the production of lactic acid, while if the sodium salt of this hexose-phosphoric acid from yeast is added to the pressed muscle juice, it decomposes into lactic and phosphoric acids.

Encouraged by his research on "lactacidogen," Emden attempted, during the late war, to increase the muscular efficiency of the German soldier by the oral administration of acid sodium phosphate in sublaxative doses. The results he reported were impressive, and again in his laboratory he showed a sharp rise in the amount of work done on the bicycle ergometer by the soldier after an administration of this salt. The effect of the phosphate lasted, in most of his experiments, for 48 hours, and frequently showed a further rise in the amount of work done in the second 24 hours over the first 24 hours. It was his custom to give the phosphate in a 4 per cent cane-sugar solution, which introduces another factor in view of the claim that cane sugar, under certain conditions, will give an increased muscular efficiency.

His reasoning as to the oral administration of acid sodium phosphate for the purpose of delaying the onset of fatigue or for producing greater muscular efficiency is not quite clear to us, especially when we take into consideration all the known facts about the metabolism of phosphates. It appears to be the consensus of opinion that ordinary activity or vigorous exercise by a trained man does not increase the excretion of phosphorus. It is only when the exercise is so strenuous as to cause tissue destruction that an excess outgo of phosphorus and other tissue katabolites occurs. The greatest excretion of phosphorus occurs in this case after the termination of the exercise and may persist for several days. Lehmen (4) found that the inorganic phosphate in rabbit's blood remained constant within biological limits, while if through any means it should be increased to four or five times the normal concentration it would return to normal inside of four hours. We ourselves have examined the blood of dogs within an hour and a half after the oral administration of sublaxative amounts of acid sodium phosphate and could not detect any increase in the phosphate content of the blood. Underhill (5), working with solutions of mono-, di-, and tri-sodium phosphate, which he injected subcutaneously, found considerable increase in the urinary phosphate, 70 to 100 per cent of the injected phosphate being recovered in the urine. He also noted that the character of the diet and nature of the phosphate had no apparent influence on the percentage of the injected phosphate excreted in the urine. Again, Meigs and coworkers (6) call attention to the fact that the urinary excretion of phosphorus is actively influenced by the concentration of the inorganic

phosphate in the blood plasma. Their results indicated that it is influenced by another factor, which was connected with the acid equilibrium of the body. Kingo Goto (7) seems to have confirmed this last observation by showing that the muscle lost markedly in phosphorus and potassium and somewhat in sodium during acidosis.

It may be that Emden's subjects, on account of the nutritional conditions, underwent greater tissue destruction than would occur in a well-nourished man, and that the phosphorus requirements of the body were satisfied by the intake of the acid sodium phosphate. Bauer (8) writes: "As a rule we take in with our food a far larger quantity of salts than is necessary for the replacement of those of the tissues. The excess is excreted with the urine, and only when an increase in the body weight occurs is any large amount of salts retained in the body." According to Sherman (9), in 41 per cent of 150 dietaries of American families or larger groups examined, and which were believed to be fairly representative, the phosphorus content was found to be below the standard.

#### Present Study

*Outline of present study.*—It was decided to divide the study into three parts, as follows:

- (1) Animal experiments.
- (2) Subjective experiments in which the more general physiological effects of acid sodium phosphate were studied.
- (3) A study of the increase in production in man. During this part of the study we purposely refrained from asking any questions of those participating in the test, so as to avoid introducing any psychological factor into the experiment.

*Preparation and administration of the acid sodium phosphate.*—The phosphate was dissolved in a 4 per cent cane-sugar solution in sufficient quantity to make a 15 per cent solution of the salt, so as to duplicate Emden's dosage. Each subject was tested as to his or her tolerance toward the salt, as it was our aim to keep the dosage down to sublaxative amounts. Our experience indicates that in human beings this dosage varies from  $2\frac{1}{2}$  to 7 grams. Once the dosage was determined for the individual, it was not found necessary to change the amount during the study. Any increase was sure to produce a laxative effect. As a rule, the salt was taken each morning before beginning work. Those participating in the production part of the study took the salt about breakfast time.

#### 1. ANIMAL EXPERIMENTS

Our animal experiments proved disappointing, inasmuch as we were unable to arrive at any satisfactory base line from which to start in judging the effect on work production of an administration of acid sodium phosphate.

We used the Dourdoure strain of the albino rat in these experiments. Male rats varying in weight from 200 to 300 grams were selected and tested as to their willingness to run in the mill. These rats were placed on a balanced diet for two weeks before they were subjected to a training period. This training period consisted in running the rats for a short period each day until they had lost their flabbiness and their muscle became firm. The weights of the rats remained constant or increased slightly during the period that they were being conditioned for the actual fatigue tests.

*Apparatus.*—We made use of the revolving drum for fatiguing the rats. The apparatus consisted of six drums, 16 inches in diameter and 10 inches wide, driven at a uniform speed by an electric motor, which permitted us to exercise six rats at the same time. These drums were built of one-quarter-inch-mesh galvanized wire net and were lined over three-fourths of the width with corrugated rubber matting. This was necessary because it was found that when the rats ran for a long period on the naked wire their feet became sore. It also had an advantage, as it prevented their hanging on to the wire netting and being carried around with the cage, and which, as a rule, resulted in torn toenails.

The rate at which the drums should revolve received considerable attention, and it was finally decided after much experimental observation to turn them at a speed of eight revolutions per minute. This kept the rats moving at what appeared to be a natural running gait; whereas if the speed were increased very much they became bewildered, clung to the sides of the wheel, and were thrown around and fatigued more from the rough treatment than from physical exercise.

The question which concerned us most in the animal work was the standard by which we could measure the fatigue of the rat or even determine whether the rat was really fatigued or not. It was finally decided that the rat should be kept running until it lay down on its back and did not respond to any external knocks on the side of the drum. Then, if on removal from the drum it was content to remain quiet and showed no interest in food placed near it, we considered it fatigued.

When the rats were first placed in the drum after the hardening period, it was found that they were unable to run for a longer time than six hours as determined by our adopted standard. With each successive period of running there was an increment in the running time of from three to six hours. As soon as they were able to run steadily for 24 hours, we decided to stop the drum every six hours to permit the rat to rest, eat, and drink a little. This rest period never amounted to more than half an hour each time. This procedure was considered necessary as otherwise the element of exhaustion from thirst and starvation would have complicated the results. In spite

of all precautions we were unable to arrive at a base line. Rats that would run for 50 hours would jump to 90 hours in the next running period. On the other hand, rats that had run 50 hours would drop down to 10 and 12 hours. Autopsies on some of the rats suggested that the variations in length of runs were due to pathological heart conditions.

After working with the rats for three months we decided to abandon this part of the study because of the inadvisability of proceeding with experiments in which no normals or base lines could be obtained. Our previous work with dogs did not encourage us to use them in the place of rats.

## 2. SUBJECTIVE EXPERIMENTS

For the purpose of studying the general physiological effects of the salt on human beings, we were fortunate in having 40 persons volunteer to take the salt under our direction for a period of two months. This group consisted of medical men, scientific workers, stenographers, and laboratory attendants. From time to time we substituted acid sodium tartrate solution without telling the individual that it was being done. As a check on their subjective observations we kept a record of body weight and blood pressure. The value of these data was proved in various instances and was interesting from a psychological viewpoint. On the whole, our reports thoroughly confirmed the worthlessness of most subjective studies in this field, but in this mass of contradictory evidence certain points stand out clearly, and only these need be considered here.

The consensus of opinion is that the group, as a whole, felt better for the taking of the phosphate and none felt any ill effect. All agreed that the reason for the general improvement was a more regular evacuation of the bowel. This is not surprising when one considers the great majority of persons in our own country who are suffering from various degrees of constipation. Acid sodium phosphate is recognized by the medical profession as having a laxative effect. The profession has also used this salt in the treatment of pyelitis, either to render the urine acid or to increase its acidity for the purpose of assisting the action of hexamethylentetramine, which is active only in acid solution. Acid sodium phosphate is more pleasant to take than other saline laxative; it is positive in its effects, without the griping and uncomfortable symptoms so often complained of when other purgatives are taken.

As has been previously stated, one of the premises of our work was the avoidance of laxative doses, and great care was taken to avoid any flushing effect. Still, the fact remains that it did stimulate the alimentary tract to some extent, and that the evacuations of those taking the salts were more regular and of a free nature, requiring no straining at the stool. Moreover, the number of evacuations in-

creased to two or three a day. One feature to be noticed was the absence of any binding effect on the days on which the salt was not taken, and that the beneficial stimulation of the intestinal tract appeared to last for several days. Over 80 per cent of those volunteering for the study were suffering from various degrees of constipation, and felt the beneficial effect brought about by the elimination of body waste. It was noticeable that those subjects who did not report any improvement were those who were feeling fit and well and were regular in their habits and hence did not need laxative effects of the acid sodium phosphate.

The benefits accruing from taking the salts manifested themselves by increased appetites, increased weight, absence of bad breath, disappearance of headaches, and a slight drop in blood pressure. Persons who were accustomed to going without breakfast found that they were now compelled to eat a substantial meal. Several reported that they were able to remain up later at night and awoke the next morning feeling less tired than had been their habit at the beginning of the experiment. Unfortunately the type of work in which this group were engaged prevented any study of improvement in their productive ability.

Dujardin-Beaumetz, in discussing the utility of adding phosphate to food and the favorable results which have been noticed, suggests that they probably are due to a regulatory action on the alimentary tube, or to some acid element which it conveys to the stomach, or to some other indirect result.

### **3. INCREASE IN PRODUCTION DUE TO INGESTION OF ACID SODIUM PHOSPHATE**

Through the cooperation of the Federal Post Office Department, in Washington, we were able to obtain the assistance of 30 girls employed in the auditing section for this part of the study. The girls volunteered to take the salt regularly for us on the condition that if they felt any ill effect they could drop out of the test at any time.

These girls were working card-perforating machines, which are operated electrically and controlled by 12 keys arranged in four rows. Most of the girls use the touch system, involving at least three fingers on the right hand, while the left hand is used in feeding the cards into the machine. The girls complain that their arms become tired from the operation. They work in well lighted and ventilated rooms. The hours of employment are from 9 a. m. until 4.30 p. m., with half an hour for lunch from 12 until 12.30, and with 15 minutes' rest periods in the morning and afternoon, making actual operation of the machine six and a half hours. These girls are practically engaged in piecework, as their pay for any six months

is determined by the average daily number of cards correctly punched during the previous six months.

The office keeps a record of the work of each girl from the first day she begins to work until she leaves the employment of the department, and because of this record they presented an ideal group on which to make such a study as we were conducting.

As a control group we used the record of girls employed at the same time who were not taking the phosphate and did not know that they were being used for that purpose.

Records of production and errors in the city post office were obtained for the period from February 15, 1924, to May 31, 1924, the phosphate being given from March 13 to April 24 to 30 girls.<sup>1</sup> A group of 20 girls, for whom records were obtained for the entire

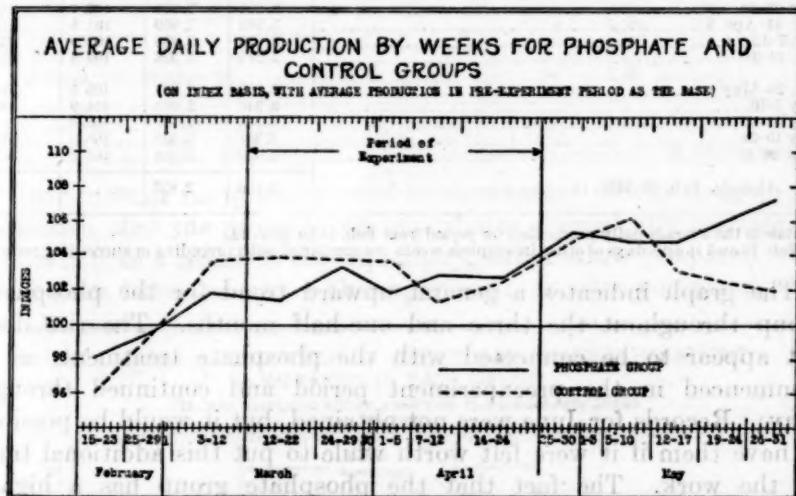


FIG. 1

period, served as controls. The control group was selected at random from the other girls performing the same operation.

The records give the production for each day for each girl. Whenever the girl's time at the office was less than seven hours, the exact time was put down, but all those who showed less than six and three-fourths hours at the office were excluded from our records for that day.

First is presented a table and graph giving the average daily production by weeks throughout the period for two groups—those given the phosphate, and those serving as controls. (Tables 1 and 2; Figs. 1 and 2.) For the purposes of the graph, the averages have been reduced to indices, using as the base the average daily production in the preexperiment period. Since the phosphate admin-

<sup>1</sup> Records for two (Nos. 26 and 126) of the 30 girls were incomplete; hence the study has been limited to 28 girls.

istration was commenced and ended in the middle of the week, the data have been divided at these points, and the incomplete parts combined with the preceding or succeeding week, as the case may be.<sup>2</sup>

TABLE 1.—*Average daily production by weeks for phosphate and control group*

Period	Average daily production		Indices <sup>1</sup>	
	Group receiving phosphate	Control group	Group receiving phosphate	Control group
Feb. 15-23 <sup>2</sup>	3,125	2,744	98.1	96.0
Feb. 25-Mar. 1	3,170	2,835	99.5	99.2
Mar. 3-12	3,241	2,961	101.8	102.6
Mar. 13-22	3,228	2,961	101.4	103.6
Mar. 24-30	3,294	2,964	103.4	103.7
Mar. 31-Apr. 5	3,242	2,950	101.8	103.6
Apr. 7-12	3,276	2,890	102.9	101.2
Apr. 14-24	3,274	2,928	102.8	102.5
Apr. 25-May 3	3,360	2,967	105.5	104.9
May 5-10	3,340	3,033	104.9	106.2
May 12-17	3,345	2,948	105.0	103.2
May 19-24	3,381	2,928	106.2	102.5
May 26-31	3,419	2,916	107.3	102.1
Average, Feb. 19-Mar. 12	3,185	2,857	-----	-----

<sup>1</sup> Base is the average daily production for period from Feb. 15 to Mar. 12.

<sup>2</sup> Feb. 15 and 16 and days of other incomplete weeks are combined with preceding or succeeding periods.

The graph indicates a general upward trend for the phosphate group throughout the three and one-half months. The rise does not appear to be connected with the phosphate treatment, as it commenced in the preexperiment period and continued through May. Records for June were not obtained, but it would be possible to have them if it were felt worth while to put this additional time on the work. The fact that the phosphate group has a higher average production than the other group is of course of no significance. We are concerned only with the changes in the production curve.

The control group, being smaller, fluctuates more than the other group, but also suggests an upward trend. The control curve crosses the phosphate curve in each period. Certainly no evidence of any effect due to the phosphates is offered by this table and graph.

That the upward trend noted above occurs chiefly among the workers with least efficiency is indicated by Table 2 and Figure 2, which are similar to the first table and graph, but are limited to the 10 most efficient workers in each group (those with the 10 highest averages in the preexperiment period.)<sup>3</sup>

<sup>2</sup> February 15 and 16 were also combined with the succeeding week to avoid too great fluctuation.

<sup>3</sup> The numbers of the girls used for this table and graph were: Phosphate group: 10, 24, 27, 43, 50, 81, 85, 100, 106, 114. Control: 9, 11, 14, 45, 63, 67, 68, 89, 92, 121. See Tables 4 and 5 for individual production in preexperiment period.

TABLE 2.—*Average daily production by weeks for 10 most efficient workers in each group<sup>1</sup>*

Period	Average daily production		Indices <sup>2</sup>	
	Group receiving phosphate	Control group	Group receiving phosphate	Control group
Feb. 15-23 <sup>3</sup>	3,615	3,518	97.7	99.8
Feb. 25-Mar. 1	3,657	3,541	99.6	100.3
Mar. 3-12	3,778	3,533	102.1	100.1
Mar. 13-22	3,711	3,556	100.3	100.7
Mar. 24-30	3,731	3,545	100.8	100.4
Mar. 31-Apr. 5	3,723	3,582	100.5	101.4
Apr. 7-12	3,736	3,607	100.9	102.2
Apr. 14-24	3,740	3,562	101.1	100.9
Apr. 25-May 3	3,761	3,541	101.6	100.3
May 5-10	3,743	3,545	101.1	100.4
May 12-17	3,708	3,520	100.2	99.7
May 19-24	3,711	3,526	100.3	99.9
May 26-31	3,730	3,531	100.8	100.0
Average, Feb. 15-Mar. 12	3,701	3,531	-----	-----

<sup>1</sup> Ten with highest average daily production during preexperiment period.<sup>2</sup> Base is the average daily production for period from Feb. 15 to Mar. 12.<sup>3</sup> Feb. 15 and 16 and days of other incomplete weeks are combined with preceding or succeeding periods.

Here little or no upward trend is observable. There is again no indication that the group given phosphates showed any increase in production as a result of this treatment, either when compared with the periods before and after the experiment, or when compared with

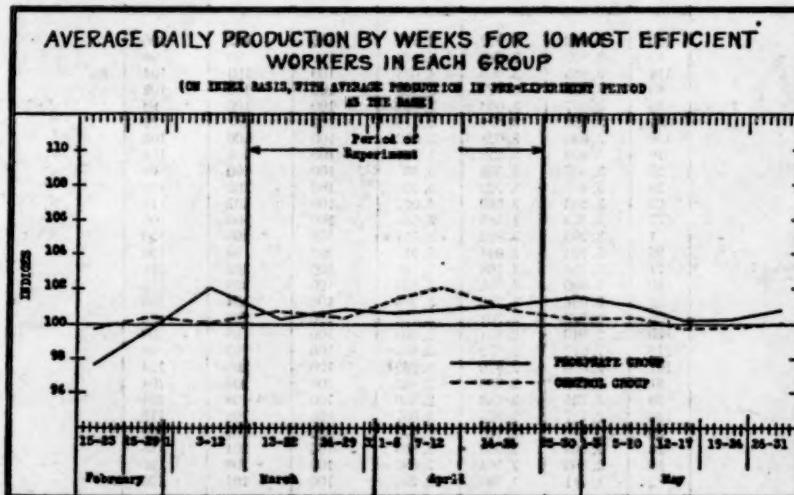


FIG. 2

the control group. The phosphate group reached one of its highest points before the experiment was begun, and the other after it was ended.

To be entirely certain of our conclusions, however, it seemed well to study also the individual workers, as it was possible that a few

might have shown increased production without affecting the total group appreciably. The next two tables (3 and 4) therefore give for the three periods (before the experiment, during the experiment, and after the experiment) the average daily production of each worker, both those given phosphates and those not given phosphates. For convenience, these averages are reduced to indices, using as the base the production during the preexperiment period. A 10 per cent increase, obviously, in production during the second period over the first period, therefore, would be indicated by the figure 110 in the second period. It is observed that in no instances among those given phosphates does the index figure for the second period reach 110, and that in those cases where it is somewhat high it is likely to be still higher in the third period (thus suggesting that the increase probably is connected with some other factor independent of the effect of the phosphate). The tables for the phosphate group and for the control group are very similar and the differences appear to be due to chance.

TABLE 3.—*Average daily production in three periods for each worker given phosphates, with indices<sup>1</sup>*

No. of worker	Average daily production			Indices <sup>1</sup>		
	Feb. 15-Mar. 12	Mar. 13-Apr. 24	Apr. 25-May 31	Feb. 15-Mar. 12	Mar. 13-Apr. 24	Apr. 25-May 31
160	3,912	3,989	3,917	100	102	100
85	3,863	3,813	3,823	100	98	98
114	3,865	3,969	4,033	100	103	104
43	3,730	3,822	3,800	100	102	102
50	3,657	3,663	3,628	100	100	99
81	3,638	3,674	3,716	100	101	99
106	3,636	3,623	3,652	100	100	100
10	3,600	3,638	3,743	100	101	104
27	3,507	3,508	3,435	100	100	98
24	3,457	3,522	3,529	100	102	102
62	3,403	3,630	4,002	100	107	118
77	3,375	3,583	3,583	100	106	106
1	3,205	3,392	3,538	100	106	140
96	3,194	3,044	3,210	100	95	100
71	3,100	3,168	3,144	100	102	101
80	3,090	3,331	3,425	100	108	111
32	3,084	3,218	3,268	100	104	104
25	3,033	3,201	3,176	100	106	105
120	2,940	2,871	2,905	100	98	99
115	2,911	2,872	2,863	100	99	98
107	2,876	2,876	3,269	100	100	114
51	2,819	2,905	2,942	100	103	104
59	2,735	2,683	2,850	100	98	104
124	2,717	2,933	3,057	100	108	112
29	2,670	2,778	2,673	100	104	100
16	2,563	2,668	2,593	100	104	113
55	2,563	2,564	3,586	100	100	140
82	1,911	1,995	2,295	100	104	120
Median ratios <sup>2</sup> .....				100	102.1	103.8

<sup>1</sup> Average daily production for period Feb. 15 to Mar. 12 is the base.

<sup>2</sup> In calculating median (middle item) the indices were carried to one decimal place.

TABLE 4.—*Average daily production in three periods for each worker in control group, with indices<sup>1</sup>*

No. of worker	Average daily production			Indices <sup>1</sup>		
	Feb. 15-Mar. 12	Mar. 13-Apr. 24	Apr. 25-May 31	Feb. 15-Mar. 12	Mar. 13-Apr. 24	Apr. 25-May 31
14	3,816	3,975	4,086	100	104	107
9	3,633	3,402	3,492	100	94	96
63	3,622	3,542	3,540	100	98	98
121	3,589	3,529	3,452	100	98	96
67	3,587	3,562	3,716	100	99	104
92	3,560	3,585	3,446	100	101	97
45	3,493	3,503	3,500	100	100	100
11	3,380	3,369	3,388	100	100	100
68	3,357	3,358	3,285	100	100	98
89	3,293	3,472	3,334	100	105	101
17	3,044	3,029	3,037	100	99	100
44	2,900	2,987	3,012	100	103	104
95	2,799	2,781	2,932	100	99	105
47	2,660	2,828	3,019	100	106	114
73	2,377	2,681	3,042	100	113	128
102	2,277	2,282	2,456	100	100	108
86	1,893	2,232	2,413	100	118	127
41	1,060	1,208	1,262	100	114	119
7	367	391	747	100	107	203
Median ratios <sup>2</sup> -----				100	100.3	103.6

<sup>1</sup> Average daily production for period Feb. 15 to Mar. 12 is the base.<sup>2</sup> In calculating median (middle item) the indices were carried to one decimal place.TABLE 5.—*Average daily production by weeks for each worker given phosphates (in tens)<sup>1</sup>*

No. of worker	Feb. 15-23 ( <sup>2</sup> )	Feb. 25-Mar. 1	Mar. 3-12	Mar. 13-22	Mar. 24-29	Mar. 31-Apr. 5	Apr. 7-12	Apr. 14-24	Apr. 25-May 3	May 5-10	May 12-17	May 19-24	May 26-31
100	389	388	395	398	398	397	410	395	398	392	383	390	394
85	393	390	386	384	380	381	386	378	379	378	388	383	388
114	370	398	393	386	405	392	397	404	498	412	410	405	397
43	361	373	382	381	374	380	393	383	386	382	383	377	369
50	353	352	384	363	371	369	360	367	372	383	353	356	376
81	345	356	382	366	372	364	352	377	380	374	368	363	370
105	355	369	368	362	365	364	364	359	360	373	361	364	367
10	355	361	372	361	345	373	371	347	377	384	364	376	368
27	343	352	357	355	369	344	345	338	345	345	342	340	347
24	341	344	351	352	352	349	354	353	353	352	352	356	352
62	317	352	344	343	344	341	369	396	426	396	392	389	388
77	349	305	368	356	363	369	356	354	351	358	363	364	356
1	307	317	333	336	335	346	347	337	367	363	348	338	345
95	304	300	341	307	300	303	303	305	323	326	318	310	328
71	313	309	309	312	317	322	318	317	320	317	314	309	310
89	310	310	305	306	312	339	355	341	348	348	335	337	343
32	291	300	318	319	324	320	322	325	322	320	321	318	323
25	298	297	312	320	319	318	323	320	319	319	311	314	330
120	303	289	290	291	292	286	289	279	294	295	287	283	288
115	288	283	297	283	301	284	281	289	269	288	291	296	288
107	293	273	299	300	294	282	285	273	340	327	340	325	311
51	278	276	288	288	287	300	304	283	291	300	292	299	300
59	260	271	284	260	276	267	260	267	281	260	294	292	292
124	264	278	275	266	296	283	295	303	300	313	308	300	300
50	277	275	256	273	285	294	273	273	290	241	271	260	264
16	253	268	252	265	266	260	263	275	285	292	289	288	294
85	251	252	262	255	265	253	255	256	291	387	377	377	375
82	177	198	198	201	186	191	188	219	219	231	239	-----	-----

<sup>1</sup> That is the figures given in the table are one-tenth of the actual averages.<sup>2</sup> February 15, 16, and other incomplete weeks are combined with preceding or succeeding periods.

In Table 5 are given figures representing the average daily production, by weeks, for each worker and these data are plotted in Figures 3 and 4 (except for a few individuals showing very erratic curves).

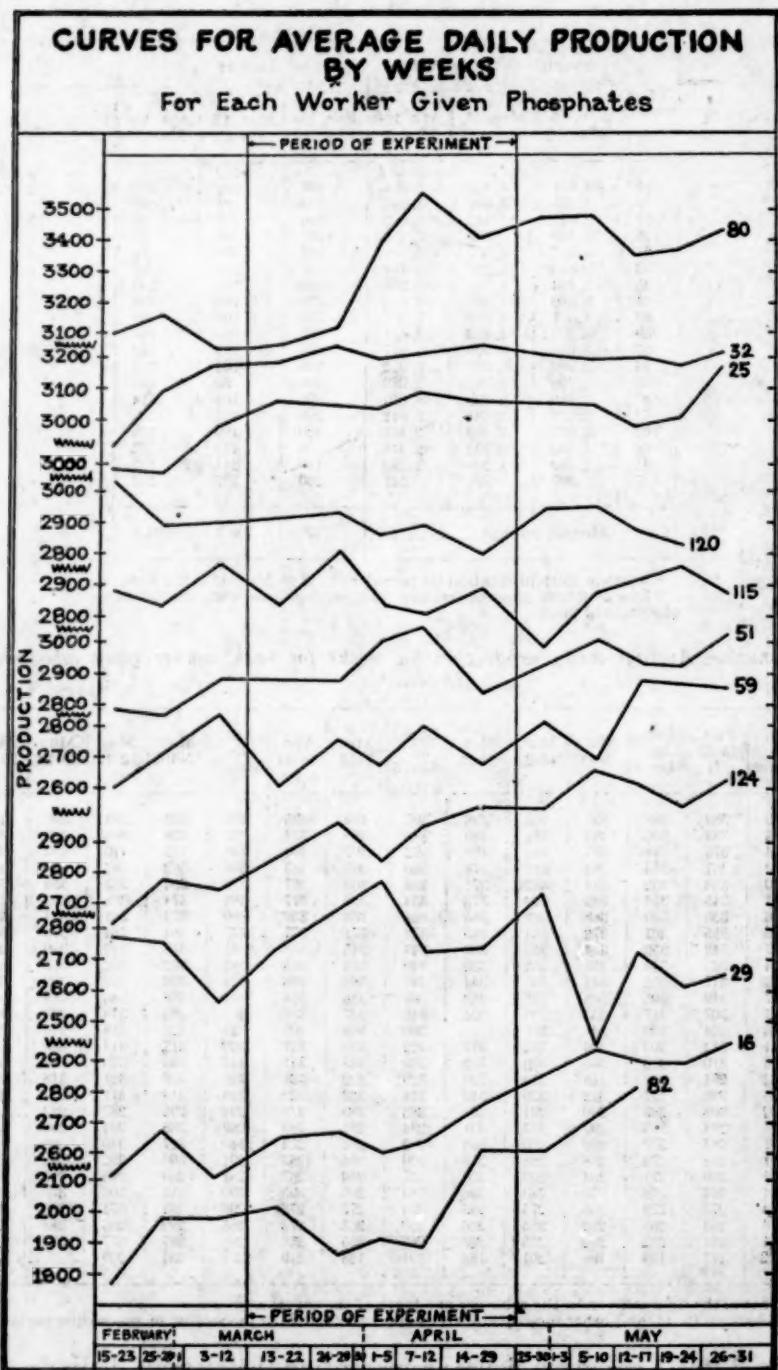


FIG. 3

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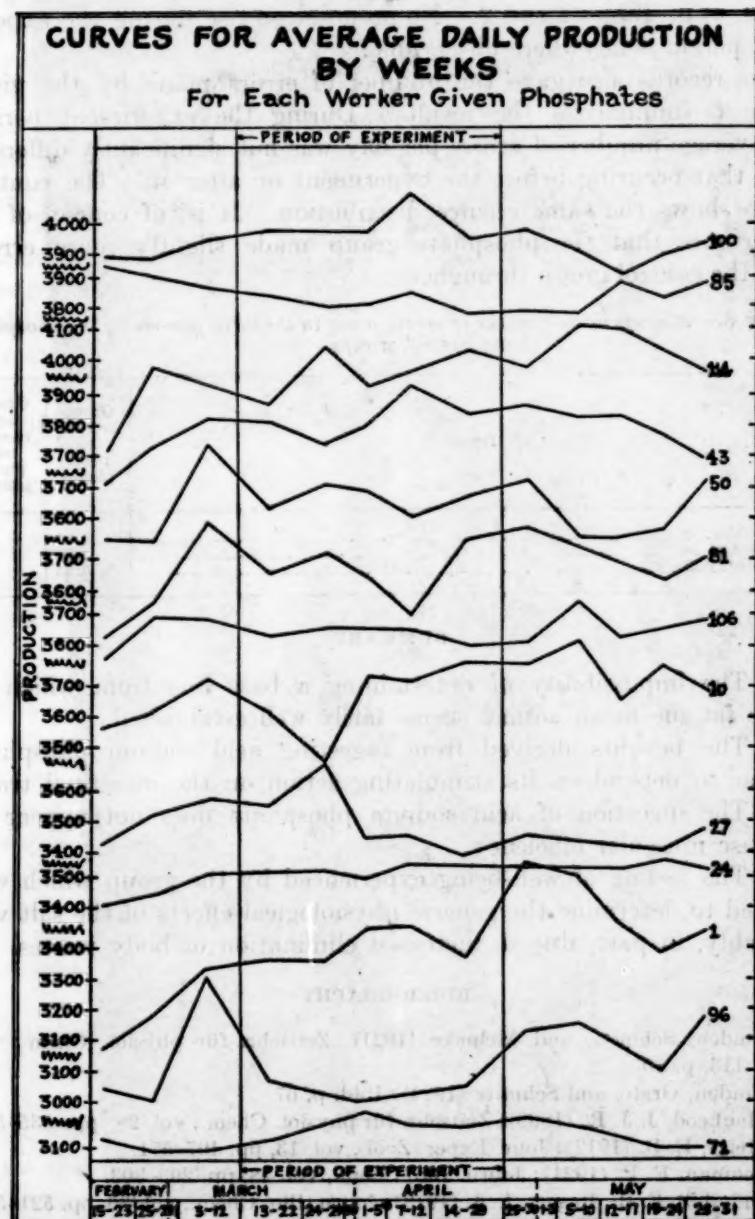


FIG. 4

To save space in the table the averages have been given without the final place. Thus the figures are one-tenth of the actual averages. Parts of weeks have been combined with preceding and succeeding weeks, as in Tables 1 and 2. No pronounced rise during the experiment period is anywhere observable.

The records also gave the number of errors made by the girls. Table 6 summarizes the results. During the experiment period the average number of errors per day was not significantly different from that occurring before the experiment or after it. The control group shows the same chance distribution. It is, of course, of no importance that the phosphate group made slightly more errors than the control group throughout.

TABLE 6.—*Average daily number of errors made in the three periods by the phosphate and control groups*

Period	Group receiving phosphates	Group not receiving phosphates
Feb. 15-Mar. 12	1.94	1.69
Mar. 13-Apr. 24	1.99	1.73
Apr. 25-May 30	1.93	1.64

#### SUMMARY

1. The impossibility of determining a base line from which to judge fatigue in an animal seems fairly well established.
2. The benefits derived from ingesting acid sodium phosphate appear to depend on its stimulating action on the intestinal tract.
3. The ingestion of acid sodium phosphate does not appear to increase muscular efficiency.
4. The feeling of well-being experienced by the group which was studied to determine the general physiological effects of the salt was probably, in part, due to increased elimination of body wastes.

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## PUBLIC HEALTH ENGINEERING ABSTRACTS

**A Study of Milk Problems in Canada.** Committee of the Canadian Public Health Association, Dr. M. M. Seymour, chairman. *Public Health Journal*, vol. 17, No. 5, May, 1926, pp. 241-244. (Abstract by R. E. Tarbett.)

The authors discuss the findings of the committee appointed for the purpose of making a study of "Milk Problems" and reporting its findings at the annual meeting of the Public Health Association of Canada.

The report is based on a questionnaire addressed to the various health departments (city and provincial) of Canada. Statistics have been compiled from the data furnished in the replies, and have been added as an appendix to the report. The report is in the nature of a preliminary study and outline of the difficulties confronting the public health officer in safeguarding the milk offered for sale in his community.

The authors urge the necessity of encouraging dairy farming, by every possible means, to increase the volume of supply and the number of producers. This increase in supply and number of producers will bear upon the health aspect of the question, the authors point out, as keener competition will enable the public health officer to raise the standard of production.

An average per capita consumption of 0.71 pint per day for the 21 cities reporting is compared with the per capita consumption of 0.54 pint per day in New York in 1923.

Data regarding epidemics of milk-borne disease in Canada were collected, and the results have been set down in the appendix to the report. It was noted that only two diseases, typhoid fever and scarlet fever, are named as occurring in the epidemics traced to milk infection, and that no records are available regarding diphtheria and septic sore throat conveyed by milk supplies. The epidemics reported on are regarded as representing only a small proportion of the outbreaks that have occurred.

The importance of safeguarding the milk supply is pointed out, as, the authors state, milk has been the means of causing more disease than any other single food.

Local problems in connection with milk control, as reported on by the various provincial and city departments of health, are set forth in the article, among which were included the following: Difficulty of insuring cleanliness in the handling of milk and in the care of cows and stables, ignorance of farmers and difficulty of reaching them in the rural districts, difficulty of enforcing pasteurization of milk.

**Hog Feeding at Flint, Mich.** Nahum W. Long. *Public Works*, vol. 57, No. 3, April, 1926, pp. 81-82. (Abstract by J. K. Hoskins.)

Flint, with a population of about 135,000, acquired a run-down farm about 12 miles distant that had railroad shipping facilities available and used this farm for disposal of town garbage by feeding hogs. From 1,000 to 1,700 head are maintained, depending on the flow of garbage.

Methods of feeding, soil renovating, and cleaning are described. Selection of the proper stock for feeding is emphasized and the procedure followed in keeping the animals in proper condition is outlined. The profit last year from feeding amounted to over \$40,000.

**The Influence of Soft and of Hard Waters on the Decomposition of Sewage.** J. E. Purvis, chairman, Cambridge Sewage Disposal Committee. *Surveyor*, vol. 69, No. 1781, March 5, 1926, pp. 277-278. (Abstract by Rudolph E. Thompson.)

It has been previously shown by the author and his colleagues that the decomposition of sewage occurs very slowly when the sewage is mixed with sea water or other saline solutions. In the present investigation experiments were carried out to determine whether the hardness of the water employed for carrying the sewage had an influence on the rate of decomposition. Mixtures of domestic sewage and soft water (distilled) and of domestic sewage and hard water (18.5° and 25°) were aerated under parallel conditions at varying rates and for different periods of time. The results of these experiments showed that oxidation occurred much more rapidly in the soft-water mixtures than in the hard-water mixtures, the free and albuminoid ammonia and oxygen consumed values in every instance being lower in the former than in the latter after aeration. The nitrites were irregular, but the nitrates were invariably higher with the soft water. It was also observed that the hard-water mixtures were more opalescent in appearance, probably due to the precipitation of colloidal substances. This would increase the amount of sludge deposited during tank treatment, thus reducing the load on the subsequent treatment processes employed. The importance of considering these factors in comparing the results of different plants and methods of purification is emphasized.

**Recent Experiments in Dewatering Sewage Sludge.** Herbert D. Bell, manager and chemist, Barnsley Sewage Works. *Surveyor*, vol. 69, No. 1775, January 22, 1926, pp. 79-81. (Abstract by Rudolph E. Thompson.)

Experiments are described in which sewage was dried from moisture content of 98 per cent to about 80 per cent by draining for about 20 hours on a sludge bed consisting of land drains, overlaid with granite and topped with sand. The sludges experimented with were of three types—liquid sludge produced by precipitation with lime (4 g. p. g.), plain sedimentation sludge, and limed sedimentation sludge. The presence of lime, added either prior or subsequent to

settling, facilitated dewatering, the plain sedimentation sludge requiring 68 hours to drain to 80 per cent moisture, whereas that containing lime required only 20 hours. The effluent was perfectly bright and clear. Beds prepared with various sands and with ashes as top dressing (3 inches) were compared and it was found that sand with smooth, rounded grains gave the best results, and that removal of sludge cake could be carried out more readily than in the case of ashes and sand with rough angular grains. The drying process appears to continue when the cake is removed and tipped on to small heaps, the sludge heating up and emitting large volumes of water vapor when disturbed.

**Sewage Sludge.** Anon. *American Journal of Public Health*, vol. 16, No. 1, January, 1926, pp. 39-42. (Abstract by A. L. Dopmeyer.)

This article is the progress report of the Committee on Sludge of the A. P. H. A., presented at the meeting in October, 1925.

Increased interest in the use of sewage sludge on the part of the agriculturist and fruit grower, and the demand upon the part of the golf clubs, flower growers, and fertilizer manufacturers for the organic nitrogen in the sludge when reduced to a dry basis are given as the outstanding features of the progress made during the year in sludge disposal.

Particular instances are cited of attempts at economically disposing of sewage sludge from some of the larger sewage plants, particularly those of the activated sludge type. It is suggested that the activated sludge process might be used more if some method were discovered for economically disposing of the sludge from both large and small plants and the committee recommends that caution be used in approving plans for new projects.

**The Relation of Storage Water Supply Lakes to Malaria.** J. A. Le Prince, United States Public Health Service. *Journal North Carolina Section American Water Works Association*, vol. 3, No. 1, pp. 42-50. (Abstract by L. D. Fricks.)

The dangers of increasing mosquito production and, perhaps, malaria prevalence, by impounding waters are clearly pointed out in this paper. The problem of impounding city water supplies without increasing these dangers has become serious for southern cities and will continue so until the engineer responsible for planning and constructing these reservoirs familiarizes himself with and applies proper measures for the control of mosquito production. An outline is given of regulations for impounded waters as suggested by the United States Public Health Service and adopted by several Southern States.

The cardinal points of these regulations are as follows: Care of laborers employed in construction work; clearing of reservoir basin;

prevention of log jams; drift and flotage; fluctuation of water level; clearing of shore line; regular inspections for mosquito production; stocking with *Gambusia*; control of separate pools and seepage places around reservoirs; and licensing by State board of health.

### **ILLINOIS ADOPTS REGULATIONS REGARDING ZINC STEARATE CONTAINERS**

The Illinois Department of Public Health recently adopted regulations relating to containers for zinc or other stearate toilet or dusting powders. The said regulations went into effect June 10, 1926, and read as follows:

Whereas it has been reported to the Department of Public Health of the State of Illinois that accidents and deaths have been caused from the inhaling of stearate of zinc dusting powders by children; and

Whereas, by investigation and survey, the said department of public health has secured data showing numerous accidents and deaths which were caused from the inhaling of such powders by children; and

Whereas, by investigation, research, and survey, the said department of public health has determined that stearate of zinc dusting powders are poisonous when inhaled; and

Whereas it has been determined by the said department of public health that the lack of proper containers for such stearate of zinc dusting powders is the underlying cause of these accidents and deaths; and

Whereas it is determined by the said department of public health that such accidents and deaths from the inhaling of stearate of zinc dusting powders will be prevented if such stearate of zinc dusting powders are dispensed in containers so constructed as to prevent seepage or spilling from the joints and seams and equipped with an automatic closing top;

Therefore the Department of Public Health of the State of Illinois, pursuant to statutory power vested in this department, hereby adopts and promulgates the following rules and regulations:

**RULE I.** No person, persons, company, or corporation shall, from and after the 10th day of June, A. D. 1926, sell, offer for sale, or dispense to the general public, zinc or other stearate toilet or dusting powders, or toilet or dusting powders containing stearate of zinc or other stearate having similar physical properties as one of the ingredients in excess of 10 per cent by weight, unless such dusting powders shall be sold, offered for sale, or dispensed in containers which comply with the specifications set forth by these rules.

**RULE II.** Containers shall be substantially constructed. All joints and seams shall be closed by crimping, soldering, or equivalent method so as to effectively prevent separation or leakage at seams or joints.

**RULE III.** Containers shall be equipped with an extreme top with a substantial self-closing device which will remain closed at all times when not in use. The self-closing device shall be of sufficient strength to retain a closing tension of not less than 2 pounds, or 907.2 grams, throughout the ordinary life of the container in order to prevent its operation by an infant.

**RULE IV.** The extreme top shall have a diameter of not less than 2 inches, or 50.8 millimeters, in order to prevent its insertion into the mouth of an infant. The opening or openings in the top shall not exceed in total area 40 square millimeters, and the diameter of no opening shall exceed 3 millimeters.

**RULE V.** Containers shall bear in plain sight and separated from other reading matter the following label:

**CAUTION—THIS POWDER MAY BE INJURIOUS IF INHALED**

**Penalty.**—Any person, persons, company, or corporation who violates or refuses to comply with and obey these rules and regulations shall be subject to prosecution for the violation or refusal, and shall be subject to fine of not to exceed \$200 for each offense or imprisonment in the county jail not to exceed six months or both.

It shall be the duty of all local boards of health, health authorities and officers, police officers, sheriffs, constables, and all other officers and employees of the State or any county, village, city, or township thereof, to enforce the rules and regulations hereby adopted and set forth.

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### **COURT DECISIONS RELATING TO PUBLIC HEALTH**

*Authority of legislature to abolish or reduce term of office of parish board of health.*—(Louisiana Supreme Court; *Gouaux v. Smith et al.*, 107 So. 466; decided January 4, 1926.) In June, 1920, a board of health of three members was appointed for the parish of Lafourche and the plaintiff in this case was made chairman of the board and ex officio parish health officer. The term of office of the members was four years.

A 1920 statute called a constitutional convention and a proviso in the act forbade the convention to enact or adopt any article or provision reducing or shortening the terms of office of the public officials throughout the State, whether elected or appointed, and whether State, district, parish, or municipal officers. The new constitution adopted in 1921 contained the following in article 22:

Sixth. All officers, executive, legislative and judicial, State, parish, or municipal, who may be in office at the adoption of this constitution, or who may be elected or appointed before the election or appointment of their successors as herein provided, shall hold their respective offices until their terms shall have expired, and until their successors are duly qualified, as provided in this constitution, unless sooner removed, as may be provided by law; and shall receive the compensation now fixed by the constitution and laws in force at the adoption of this constitution, except as herein otherwise provided.

The constitution of 1898 contained the following provision:

The general assembly shall create for the State and for each parish and municipality therein, boards of health, and shall define their duties, and prescribe the powers thereof.

A similar provision was incorporated in the 1913 and 1921 constitutions.

Act 79 of the laws of 1921, which was an act to carry into effect the foregoing 1921 constitutional provision regarding boards of health, in terms did away with the boards of health theretofore created and

created new boards as their successors. Pursuant to act 79 a new board of health for the parish of Lafourche was appointed in March, 1922, composed of five members for a term of four years. The plaintiff was one of the members appointed but another member was made parish health officer. The plaintiff did not qualify under the new appointment but brought suit contesting the claims of the other new appointees and particularly the claim of the newly appointed health officer. Plaintiff's contention was that act 79 of 1921, so far as it attempted to shorten the term of office of the members of the parish board of health appointed in June, 1920, and particularly so far as it attempted to shorten plaintiff's term of office as parish health officer, was violative of the prohibition imposed by the 1920 act calling the constitutional convention and of the proviso quoted from article 22 of the 1921 constitution.

Judgment of the lower court was for the plaintiff, but the supreme court decided that the legislature was not deprived of its authority to abolish the offices of members of parish boards of health or to reduce the term of such offices. The court was of the opinion that the restriction in the act calling the constitutional convention was imposed upon the convention only and not upon the legislature, and that, as the portion of the constitution relating to parish boards of health did not fix the term of office, the legislature had authority to fix it. The court also held that the language quoted from article 22 of the constitution did not interfere with the authority which the legislature had to remove any public officer by abolishing his office, provided it was an office which the legislature had authority to create.

*Orders of State board of health forbidding use of schoolhouses until insanitary and unsafe conditions had been remedied held appealable.*—(Indiana Appellate Court; State Board of Health *v.* Ort, Township Trustee, 151 N. E. 31; decided March 12, 1926.) The State board of health, after hearing, entered orders condemning several schoolhouses because of certain insanitary, unsafe, and dangerous conditions, and prohibited their use for school purposes after a certain date unless and until the said conditions had been remedied. The township trustee appealed from these orders to the county circuit court. The lower court sustained the appeal and on further appeal by the State board of health the appellate court affirmed the judgment of the lower court. The question was presented to the appellate court as to the right of the township trustee to appeal from such orders of the State board of health. Chapter 90 of the laws of 1919 provided that "an appeal shall hereafter lie from all decisions of the State Board of Health of Indiana in any matter involving the building, changing, or condemnation of any school building in the State of Indiana." The

appellate court held that "The orders of the State board of health as to the schoolhouses referred to are orders which involve the changing of the building, within the meaning of the act [ch. 90] of 1919, supra, and that the appeal to the circuit court was authorized."

*Power of State to prohibit the sale, possession, etc., of peyote (pellote).*—(Montana Supreme Court; *State v. Big Sheep*, 243 P. 1067; decided January 26, 1926.) In this case, involving the possession of peyote by the defendant, an Indian, in violation of chapter 22 of the laws of 1923, the supreme court stated that "It was clearly within the power of the legislature to determine whether the practice of using peyote is inconsistent with the good order, peace, and safety of the State."

*Conviction under State pure food law upheld.*—(Wisconsin Supreme Court; *Day-Bergwall Co. v. State*, 207 N. W. 959; decided March 9, 1926.) A company manufactured and sold a compound for use in flavoring foods and confections. This compound was for use in place of vanilla extract and it was conceded that the compound was not injurious to the public health. However, caramel was used in the compound and this gave it a coloring similar to vanilla extract. It was charged that this was in violation of that portion of the State pure food law which declared an article of food to be adulterated "if it is colored or flavored in imitation of the genuine color or flavor of another substance." The conviction of the company in the lower court for violation of the above quoted portion of the law was affirmed by the supreme court, which held the law to be valid.

#### DEATHS DURING WEEK ENDED JULY 3, 1926

*Summary of information received by telegraph from industrial insurance companies for week ended July 3, 1926, and corresponding week of 1925. (From the Weekly Health Index, July 8, 1926, issued by the Bureau of the Census, Department of Commerce)*

	Week ended July 3, 1926	Corresponding week, 1925
Policies in force.....	64,897,122	60,437,798
Number of death claims.....	10,930	9,435
Death claims per 1,000 policies in force, annual rate.....	8.8	8.1

*Deaths from all causes in certain large cities of the United States during the week ended July 3, 1926, infant mortality, annual death rate, and comparison with corresponding week of 1925. (From the Weekly Health Index, July 8, 1926, issued by the Bureau of the Census, Department of Commerce)*

City	Week ended July 3, 1926		Annual death rate per 1,000 corresponding week, 1925	Deaths under 1 year		Infant mortality rate, week ended July 3, 1926 <sup>2</sup>
	Total deaths	Death rate <sup>1</sup>		Week ended July 3, 1926	Corresponding week, 1925	
Total (64 cities).....	6,398	11.6	10.3	678	662	1.55
Akron.....	33			6	0	64
Albany <sup>4</sup> .....	35	15.3	7.5	5	3	105
Atlanta.....	75			13	19	
White.....	29			3		
Colored.....	46	(*)		10		
Baltimore <sup>4</sup> .....	199	12.8	10.9	20	15	58
White.....	142			12		43
Colored.....	57	(*)		8		130
Birmingham.....	54	13.3	15.0	9	20	
White.....	23			3		
Colored.....	31	(*)		6		
Boston.....	186	12.3	11.0	26	17	73
Bridgeport.....	21			4	3	68
Buffalo.....	135	12.9	10.2	12	15	50
Cambridge.....	24	10.3	7.8	6	1	100
Camden.....	30	11.9	8.9	2	1	34
Canton.....	22	10.4	11.8	4	4	89
Chicago <sup>4</sup> .....	621	10.6	10.4	68	75	60
Cincinnati.....	120	15.2	12.5	12	3	75
Cleveland.....	165	9.0	8.7	20	25	52
Columbus.....	72	13.2	13.8	8	8	73
Dallas.....	44	11.5	15.4	4	4	
White.....	37			4		
Colored.....	7	(*)		0		
Dayton.....	40	11.8	9.9	3	1	47
Denver.....	71	13.0	12.1	7	8	
Des Moines.....	28	10.0	11.4	2	2	33
Detroit.....	288	11.6	8.0	43	32	69
Duluth.....	10	4.6	5.7	0	4	0
El Paso.....	28	13.4	14.4	9	6	
Erie.....	18			0	3	0
Fall River <sup>4</sup> .....	33	13.1	11.7	5	5	73
Flint.....	21	8.0	5.2	3	2	50
Fort Worth.....	31	10.2	13.7	7	6	
White.....	28			6		
Colored.....	3	(*)		1		
Grand Rapids.....	35	11.7	12.6	3	3	43
Houston.....	37			5	7	
White.....	24			3		
Colored.....	13	(*)		2		
Indianapolis.....	79	11.2	10.6	6	5	44
White.....	67			6		51
Colored.....	12			0		0
Jersey City.....	61	10.0	6.8	4	5	28
Kansas City, Kans.....	35	15.6	8.5	5	4	87
White.....	24			4		84
Colored.....	11	(*)		1		131
Kansas City, Mo.....	76	10.6	13.8	7	11	
Los Angeles.....	232			16	21	44
Louisville.....	98	16.4	12.4	12	13	103
White.....	69			9		89
Colored.....	29	(*)		3		188
Lowell.....	31			3	4	56
Memphis.....	65	19.1	20.3	4	10	
White.....	34			1		
Colored.....	31	(*)		3		
Milwaukee.....	91	9.2	10.8	7	14	32
Minneapolis.....	91	10.9	9.7	5	12	28
Nashville <sup>4</sup> .....	49	18.6	17.6	5	9	
White.....	25			3		
Colored.....	24	(*)		2		

<sup>1</sup> Annual rate per 1,000 population.

<sup>2</sup> Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.

<sup>3</sup> Data for 62 cities.

<sup>4</sup> Deaths for week ended Friday July 2, 1926.

<sup>5</sup> In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta 31, Baltimore 15, Birmingham 39, Dallas 15, Fort Worth 14, Houston 25, Kansas City, Kans., 14, Louisville 17, Memphis 38, Nashville 30, New Orleans 26, Norfolk 38, Richmond 32, and Washington, D. C., 25.

*Deaths from all causes in certain large cities of the United States during the week ended July 3, 1926, infant mortality, annual death rate, and comparison with corresponding week of 1925—Continued*

City	Week ended July 3, 1926		Annual death rate per 1,000 corresponding week, 1925	Deaths under 1 year		Infant mortality rate, week ended July 3, 1926
	Total deaths	Death rate		Week ended July 3, 1926	Corresponding week, 1925	
New Bedford	29			10	3	174
New Haven	42	12.0	9.6	1	4	14
New Orleans	136	16.9	20.8	12	27	—
White	74			2		
Colored	62	(*)		10		
New York	1,212	10.7	8.8	125	103	51
Bronx Borough	155	9.0	6.9	12	13	40
Brooklyn Borough	415	9.7	7.6	50	39	51
Manhattan Borough	493	13.7	11.2	49	42	54
Queens Borough	115	7.8	7.9	11	5	50
Richmond Borough	34	12.4	10.6	3	4	53
Newark, N. J.	95	10.8	9.4	8	19	38
Norfolk	26	7.8	7.1	1	4	19
White	13			1		30
Colored	13	(*)		0		0
Oakland	48	9.6	8.2	3	1	35
Oklahoma City	25			2	8	
Omaha	57	13.8	11.8	4	6	42
Paterson	25	9.1	6.6	2	1	35
Philadelphia	443	11.5	10.4	43	40	57
Pittsburgh	164	13.4	9.7	23	15	76
Portland, Oreg.	74			3	4	31
Providence	65	12.3	11.5	8	5	66
Richmond	51	14.1	9.0	8	5	101
White	28			2		39
Colored	23	(*)		6		210
Rochester	59	9.6	11.0	2	6	16
St. Louis	234	14.7	11.4	23	15	
St. Paul	51	10.7	10.8	6	4	53
Salt Lake City <sup>4</sup>	27	10.6	12.3	2	6	28
San Antonio	54	13.7	13.7	15	9	
San Diego	26	12.3	16.2	1	2	21
San Francisco	157	14.4	10.1	5	8	30
Schenectady	16	9.0	9.6	1	2	29
Seattle	54			2	7	19
Somerville	14	7.3	3.2	1	0	26
Spokane	32	15.3	10.1	3	3	70
Springfield, Mass.	41	14.7	10.6	5	2	72
Tacoma	19	9.3	9.0	3	1	70
Toledo	64	11.4	9.3	8	7	78
Trenton	38	14.8	9.1	3	3	50
Utica	24	12.1	13.3	0	1	0
Washington, D. C.	132	13.0	11.5	15	10	85
White	83			5		41
Colored	49	(*)		10		182
Waterbury	20			1	2	21
Wilmington, Del.	24	10.1	5.6	1	0	23
Worcester	37	10.0	11.5	5	6	58
Yonkers	16	7.2	5.0	1	0	22
Youngstown	32	10.1	12.1	7	4	89

For footnotes 4 and 5, see page 1484.

# PREVALENCE OF DISEASE

*No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring*

## UNITED STATES

### CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

#### Reports for Week Ended July 10, 1926

ALABAMA	Cases	CALIFORNIA	Cases
Cerebrospinal meningitis.....	1	Cerebrospinal meningitis:	
Chicken pox.....	3	Pasadena.....	1
Dengue.....	2	San Francisco.....	1
Diphtheria.....	3	Sacramento.....	1
Influenza.....	5	Stockton.....	3
Malaria.....	83	Chicken pox.....	97
Measles.....	71	Diphtheria.....	91
Mumps.....	10	Influenza.....	3
Ophthalmia neonatorum.....	1	Lethargic encephalitis:	
Pellagra.....	26	Fresno.....	1
Pneumonia.....	20	Gilroy.....	1
Scarlet fever.....	8	Measles.....	256
Smallpox.....	11	Mumps.....	79
Tuberculosis.....	41	Poliomyelitis:	
Typhoid fever.....	68	Los Angeles.....	3
Whooping cough.....	57	Long Beach.....	1
ARIZONA			
Chicken pox.....	1	Scarlet fever.....	67
Diphtheria.....	1	Smallpox.....	13
Measles.....	11	Tuberculosis.....	142
Mumps.....	4	Typhoid fever.....	11
Scarlet fever.....	10	Whooping cough.....	61
Trachoma.....	1	COLORADO	
Tuberculosis.....	7	Chicken pox.....	18
Typhoid fever.....	4	Diphtheria.....	10
Whooping cough.....	12	Influenza.....	1
ARKANSAS			
Cerebrospinal meningitis.....	1	Measles.....	22
Chicken pox.....	5	Pneumonia.....	2
Diphtheria.....	4	Scarlet fever.....	8
Hookworm disease.....	3	Tuberculosis.....	30
Influenza.....	4	Typhoid fever.....	2
Malaria.....	61	Whooping cough.....	51
Measles.....	14	CONNECTICUT	
Pellagra.....	16	Chicken pox.....	47
Scarlet fever.....	2	Conjunctivitis (infectious).....	2
Smallpox.....	1	Diphtheria.....	13
Tuberculosis.....	7	Dysentery (bacillary).....	1
Typhoid fever.....	33	German measles.....	13
Whooping cough.....	36	Influenza.....	2
		Lethargic encephalitis.....	1
		Malaria.....	2

## CONNECTICUT—continued

	Cases
Measles	148
Mumps	2
Pneumonia (all forms)	38
Scarlet fever	39
Tetanus	2
Tuberculosis (all forms)	18
Typhoid fever	7
Whooping cough	23

## DELAWARE

Chicken pox	1
Diphtheria	1
Measles	6
Scarlet fever	6
Tuberculosis	1
Whooping cough	7

## FLORIDA

Chicken pox	3
Dengue	1
Diphtheria	24
Influenza	189
Lethargic encephalitis	1
Malaria	8
Measles	25
Mumps	19
Pneumonia	184
Scarlet fever	4
Smallpox	12
Tetanus	5
Tuberculosis	127
Typhoid fever	23
Whooping cough	21

## GEORGIA

Chicken pox	12
Conjunctivitis	2
Diphtheria	7
Dysentery	61
Influenza	5
Malaria	77
Measles	35
Mumps	11
Pellagra	19
Pneumonia	12
Scarlet fever	2
Septic sore throat	9
Smallpox	8
Tuberculosis	11
Typhoid fever	93
Whooping cough	22

## IDAHO

Chicken pox	5
Diphtheria	6
Measles	10
Mumps	3
Scarlet fever	1
Smallpox	1
Tuberculosis	1
Typhoid fever	5
Whooping cough	1

## ILLINOIS

	Cases
Cerebrospinal meningitis:	
Cook County	1
Morgan County	1
Chicken pox	156
Diphtheria	63
Influenza	75
Measles	598
Mumps	26
Pneumonia	164
Scarlet fever	149
Smallpox	35
Tuberculosis	220
Typhoid fever	18
Whooping cough	167

## INDIANA

Cerebrospinal meningitis	1
Chicken pox	42
Diphtheria	27
Influenza	5
Measles	160
Scarlet fever	42
Smallpox	44
Tuberculosis	46
Typhoid fever	6
Whooping cough	100

## IOWA

Cerebrospinal meningitis	2
Chicken pox	7
Diphtheria	5
Measles	42
Scarlet fever	13
Smallpox	12
Tuberculosis	10
Typhoid fever	1
Whooping cough	13

## KANSAS

Chicken pox	14
Diphtheria	9
German measles	6
Influenza	4
Lethargic encephalitis	1
Measles	53
Mumps	18
Ophthalmia neonatorum	1
Pneumonia	11
Scarlet fever	28
Smallpox	4
Tuberculosis	49
Typhoid fever	11
Whooping cough	91

## LOUISIANA

Diphtheria	6
Influenza	41
Malaria	24
Pneumonia	44
Poliomyelitis	1
Scarlet fever	5
Smallpox	1
Tuberculosis	38
Typhoid fever	47

	MAINE	Cases	MINNESOTA—continued	Cases
Cerebrospinal meningitis		1	Lethargic encephalitis	2
Chicken pox		5	Measles	193
Diphtheria		2	Pneumonia	2
German measles		6	Poliomyelitis	3
Influenza		2	Scarlet fever	117
Measles		44	Smallpox	2
Mumps		4	Tuberculosis	61
Pneumonia		4	Typhoid fever	4
Scarlet fever		10	Whooping cough	34
Tuberculosis		6		
Typhoid fever		2		
Whooping cough		11		
	MARYLAND <sup>1</sup>		MISSISSIPPI	
Chicken pox		23	Diphtheria	3
Diphtheria		16	Poliomyelitis	1
Dysentery		3	Scarlet fever	1
German measles		1	Smallpox	5
Influenza		2	Typhoid fever	57
Measles		119		
Mumps		18		
Paratyphoid fever		1		
Pneumonia (all forms)		28	MISSOURI	
Scarlet fever		28	Cerebrospinal meningitis	3
Septic sore throat		1	Chicken pox	10
Tuberculosis		55	Diphtheria	30
Typhoid fever		12	Influenza	2
Whooping cough		91	Measles	107
	MASSACHUSETTS		Ophthalmia neonatorum	1
Cerebrospinal meningitis		2	Pneumonia	1
Chicken pox		113	Rabies in animals	6
Conjunctivitis (suppurative)		8	Scarlet fever	38
Diphtheria		45	Smallpox	3
German measles		86	Trachoma	2
Influenza		3	Tuberculosis	48
Lethargic encephalitis		2	Typhoid fever	27
Measles		274	Whooping cough	116
Mumps		53		
Ophthalmia neonatorum		40	MONTANA	
Pneumonia (lobar)		40	Chicken pox	4
Poliomyelitis		2	German measles	2
Scarlet fever		187	Measles	104
Septic sore throat		4	Rocky Mountain spotted fever:	
Tetanus		2	Baker	1
Trachoma		1	Ekalaka	1
Tuberculosis (all forms)		127	Scarlet fever	5
Typhoid fever		8	Smallpox	9
Whooping cough		139	Tuberculosis	3
	MICHIGAN			
Diphtheria		91	NEBRASKA	
Measles		330	Chicken pox	7
Pneumonia		49	Diphtheria	1
Scarlet fever		179	Measles	14
Smallpox		8	Scarlet fever	18
Tuberculosis		59	Smallpox	24
Typhoid fever		10	Whooping cough	18
Whooping cough		138		
	MINNESOTA		NEW JERSEY	
Cerebrospinal meningitis		1	Cerebrospinal meningitis	2
Chicken pox		24	Chicken pox	70
Diphtheria		34	Diphtheria	67
Influenza		1	Influenza	2
Measles			Measles	249
Pneumonia			Pneumonia	30
Scarlet fever			Scarlet fever	68
Smallpox			Typhoid fever	8
Tuberculosis			Whooping cough	80
Typhoid fever				
Whooping cough				
	NEW MEXICO			
Cerebrospinal meningitis			Chicken pox	1
Chicken pox			Diphtheria	4
Diphtheria			Dysentery (amebic)	1
Influenza				

<sup>1</sup> Week ended Friday.

NEW MEXICO—continued	Cases
German measles	1
Measles	2
Mumps	2
Pneumonia	1
Scarlet fever	3
Tuberculosis	27
Typhoid fever	5
Whooping cough	20

NEW YORK  
(Exclusive of New York City)

Cerebrospinal meningitis	1
Chicken pox	111
Diphtheria	55
German measles	112
Malaria	3
Measles	1,091
Mumps	96
Ophthalmia neonatorum	1
Pneumonia	112
Poliomyelitis	4
Scarlet fever	89
Septic sore throat	1
Smallpox	18
Tetanus	3
Typhoid fever	9
Typhus fever	1
Whooping cough	261

## NORTH CAROLINA

Cerebrospinal meningitis	1
Chicken pox	12
Diphtheria	9
German measles	14
Measles	106
Poliomyelitis	9
Scarlet fever	11
Smallpox	12
Typhoid fever	42
Whooping cough	217

## OKLAHOMA

(Exclusive of Oklahoma City and Tulsa.)

Cerebrospinal meningitis—Muskogee	1
Chicken pox	1
Diphtheria	7
Influenza	12
Malaria	57
Measles	36
Mumps	1
Pellagra	25
Pneumonia	5
Poliomyelitis—Carter	1
Scarlet fever	17
Smallpox	4
Typhoid fever	59
Whooping cough	58

## OREGON

Cerebrospinal meningitis	1
Chicken pox	8
Diphtheria	19
Influenza	5
Malaria	1
Measles	49

OREGON—continued	Cases
Mumps	12
Pneumonia	3
Rocky Mountain spotted fever	5
Scarlet fever	15
Septic sore throat	1
Smallpox	4
Portland	13
Scattering	14
Tuberculosis	9
Typhoid fever	8
Whooping cough	28

## PENNSYLVANIA

Chicken pox	159
Diphtheria	133
German measles	23
Lethargic encephalitis—Wilkinsburg	1
Measles	1,154
Mumps	28
Ophthalmia neonatorum	1
Pneumonia	34
Poliomyelitis—Monroe Township	1
Scarlet fever	251
Tetanus	1
Trachoma	2
Tuberculosis	127
Typhoid fever	52
Whooping cough	314

## RHODE ISLAND

Chicken pox	2
German measles	2
Measles	23
Mumps	1
Ophthalmia neonatorum	2
Scarlet fever	3
Tuberculosis	7
Whooping cough	43

## SOUTH DAKOTA

Actinomycosis	1
Chicken pox	1
Measles	67
Mumps	3
Pneumonia	2
Scarlet fever	315
Smallpox	1
Tuberculosis	1
Typhoid fever	3
Whooping cough	17

## TENNESSEE

Chicken pox	4
Diphtheria	2
Dysentery	3
Influenza	1
Malaria	63
Measles	51
Ophthalmia neonatorum	1
Pellagra	26
Pneumonia	12
Poliomyelitis—Memphis	1
Scarlet fever	6
Smallpox	2
Trachoma	1
Tuberculosis	27
Typhoid fever	75
Whooping cough	104

TEXAS		Cases	WASHINGTON—continued		Cases
Chicken pox		24	Smallpox		24
Diphtheria		18	Tuberculosis		21
Dysentery		6	Typhoid fever		5
Influenza		17	Whooping cough		41
Measles		9			
Mumps		19			
Ophthalmia neonatorum		1	WEST VIRGINIA		
Paratyphoid fever		3	Chicken pox		10
Pellagra		8	Diphtheria		7
Pneumonia		6	Influenza		5
Poliomyelitis		6	Measles		140
Scarlet fever		11	Scarlet fever		8
Smallpox		12	Smallpox		3
Tuberculosis		44	Tuberculosis		16
Typhoid fever		25	Typhoid fever		11
Whooping cough		85	Whooping cough		37
UTAH			WISCONSIN		
Cerebrospinal meningitis—Murray		1	Milwaukee:		
Chicken pox		4	Chicken pox		42
Diphtheria		7	Diphtheria		8
Measles		8	German measles		1
Mumps		11	Influenza		1
Scarlet fever		3	Measles		124
Tuberculosis		1	Mumps		12
Typhoid fever		1	Pneumonia		8
Whooping cough		103	Scarlet fever		10
			Tuberculosis		19
VERMONT			Typhoid fever		2
Chicken pox		5	Whooping cough		49
Diphtheria		2			
Measles		60	Scattering:		
Mumps		5	Chicken pox		72
Scarlet fever		1	Diphtheria		12
Whooping cough		22	German measles		16
			Influenza		11
WASHINGTON			Lethargic encephalitis		1
Cerebrospinal meningitis:			Measles		810
Seattle		1	Mumps		11
Spokane		1	Pneumonia		11
Stevens County		1	Scarlet fever		43
Tacoma		1	Smallpox		6
Chicken pox		36	Tuberculosis		30
Diphtheria		26	Typhoid fever		5
German measles		12	Whooping cough		90
Measles		47			
Mumps		27	WYOMING		
Poliomyelitis—Lewis County		1	Cerebrospinal meningitis		1
Rocky Mountain spotted fever—Adams County		1	Chicken pox		3
Scarlet fever		37	Measles		5
			Rocky Mountain spotted fever		1
			Scarlet fever		11
			Whooping cough		9

## Reports for Week Ended July 3, 1926

DISTRICT OF COLUMBIA	Cases	NORTH DAKOTA	Cases
Chicken pox	13	Diphtheria	4
Diphtheria	23	Measles	17
Influenza	1	Mumps	3
Measles	32	Pneumonia	2
Pneumonia	8	Scarlet fever	20
Scarlet fever	2	Smallpox	1
Tuberculosis	29	Tuberculosis	1
Whooping cough	44	Whooping cough	21

## SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Cerebro-spinal meningitis	Diphtheria	Influenza	Malaria	Measles	Pelagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
<i>May, 1926</i>										
California-----	16	454	77	6	2,047	9	11	573	144	88
Hawaii-----	1	20	95	-----	10	-----	0	2	0	7
<i>June, 1926</i>										
Arizona-----	0	5	2	0	30	-----	0	31	0	30
Connecticut-----	5	53	16	0	1,612	-----	0	314	2	9
Indiana-----	1	56	76	-----	1,767	-----	1	314	266	27

## GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

**Diphtheria.**—For the week ended June 26, 1926, 37 States reported 1,087 cases of diphtheria. For the week ended June 27, 1925, the same States reported 1,024 cases of this disease. One hundred and two cities, situated in all parts of the country and having an aggregate population of more than 30,450,000, reported 763 cases of diphtheria for the week ended June 26, 1926. Last year for the corresponding week they reported 641 cases. The estimated expectancy for these cities was 753 cases. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

**Measles.**—Thirty-four States reported 9,098 cases of measles for the week ended June 26, 1926, and 2,928 cases of this disease for the week ended June 27, 1925. One hundred and two cities reported 3,603 cases of measles for the week this year, and 1,677 cases last year.

**Poliomyelitis.**—The health officers of 37 States reported 22 cases of poliomyelitis for the week ended June 26, 1926. The same States reported 63 cases for the week ended June 27, 1925.

**Scarlet fever.**—Scarlet fever was reported for the week as follows: Thirty-seven States—this year, 2,127 cases; last year, 1,275 cases; 102 cities—this year, 1,240 cases; last year, 648 cases; estimated expectancy, 572 cases.

**Smallpox.**—For the week ended June 26, 1926, 37 States reported 355 cases of smallpox. Last year for the corresponding week they reported 444 cases. One hundred and two cities reported smallpox for the week as follows: 1926, 93 cases; 1925, 137 cases; estimated expectancy, 94 cases. No deaths from smallpox were reported by these cities for the week this year.

**Typhoid fever.**—Four hundred and forty-one cases of typhoid fever were reported for the week ended June 26, 1926, by 36 States. For the corresponding week of 1925 the same States reported 786 cases

of this disease. One hundred and two cities reported 68 cases of typhoid fever for the week this year, and 146 cases for the corresponding week last year. The estimated expectancy for these cities was 103 cases.

*Influenza and pneumonia.*—Deaths from influenza and pneumonia were reported for the week by 96 cities, with a population of more than 29,750,000, as follows: 1926, 449 deaths; 1925, 395 deaths.

*City reports for week ended June 28, 1926*

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence how many cases of the disease under consideration may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1917 is included. In obtaining the estimated expectancy the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1925, estimated	Chick-en pox, cases re-por-ted	Diphtheria		Influenza		Meas-les, cases re-por-ted	Mump-s, cases re-por-ted	Pneu-monia, deaths re-por-ted
			Cases, es-ti-mated ex-pectancy	Cases re-por-ted	Cases re-por-ted	Deaths re-por-ted			
<b>NEW ENGLAND</b>									
Maine:									
Portland	75,333	0	1	0	0	0	4	0	0
New Hampshire:									
Concord	22,546	0	0	0	0	0	3	0	0
Manchester	83,097	0	1	0	0	0	8	0	2
Nashua	29,723	0	0	0	0	0	0	0	1
Vermont:									
Barre	10,008	0	0	0	0	0	0	0	0
Massachusetts:									
Boston	779,620	25	47	21	1	0	88	57	8
Fall River	128,993	0	3	0	3	0	2	0	1
Springfield	142,065	4	2	0	0	0	5	0	0
Worcester	190,757	3	3	1	0	0	2	3	4
Rhode Island:									
Pawtucket	60,760	0	0	0	0	0	0	0	1
Providence	267,918	0	7	1	1	0	30	0	5
Connecticut:									
Bridgeport	(1)	1	4	1	0	0	2	0	0
Hartford	160,197	3	4	1	0	0	2	0	6
New Haven	178,927	5	2	0	0	0	42	0	4
<b>MIDDLE ATLANTIC</b>									
New York:									
Buffalo	538,016	25	10	15	0	1	22	1	7
New York	5,873,356	161	227	200	12	6	239	84	102
Rochester	316,786	4	5	12	0	0	32	0	1
Syracuse	182,003	1	5	2	0	0	307	6	3
New Jersey:									
Camden	128,642	6	3	8	1	1	14	0	1
Newark	452,513	32	12	5	0	0	53	17	10
Trenton	132,020	2	3	1	0	0	17	1	5
Pennsylvania:									
Philadelphia	1,979,364	50	55	49	—	1	133	5	22
Pittsburgh	631,563	11	16	12	—	3	128	0	15
Reading	112,70	1	3	1	0	0	12	0	1
<b>EAST NORTH CENTRAL</b>									
Ohio:									
Cincinnati	409,333	0	6	7	0	0	86	12	6
Cleveland	936,485	73	18	27	0	0	16	2	12
Columbus	279,836	9	2	1	0	1	32	0	1
Toledo	287,380	45	5	3	0	1	145	0	4

<sup>1</sup> No estimate made.

## City reports for week ended June 28, 1926—Continued

Division, State, and city	Population July 1, 1925, estimated	Chick-en pox, cases reported	Diphtheria		Influenza		Meas- cases reported	Mumps, cases reported	Pneu-monia, deaths re-ported
			Cases, estimated expectancy	Cases re-ported	Cases re-ported	Deaths re-ported			
<b>EAST NORTH CENTRAL—continued</b>									
Indiana:									
Fort Wayne	97,846	3	2	0	0	0	69	0	1
Indianapolis	358,819	17	3	1	0	1	8	4	4
South Bend	80,091	0	0	1	0	0	43	0	1
Terre Haute	71,071	1	0	1	0	0	11	0	1
Illinois:									
Chicago	2,995,239	176	78	69	1	1	345	31	25
Peoria	81,564	3	1	1	0	0	11	0	0
Springfield	63,923	3	0	0	1	1	9	5	0
Michigan:									
Detroit	1,245,824	59	35	112	0	0	34	2	16
Flint	130,316	7	2	1	0	0	81	0	4
Grand Rapids	153,098	2	2	0	0	0	63	0	1
Wisconsin:									
Kenosha	50,891	2	0	0	0	0	62	0	1
Madisen	46,385	8	0	0	0	0	49	1	2
Milwaukee	509,192	88	11	17	1	1	209	39	9
Racine	67,707	0	1	0	0	0	155	5	5
Superior	39,671	0	1	0	0	0	6	0	1
<b>WEST NORTH CENTRAL</b>									
Minnesota:									
Duluth	110,502	5	1	2	0	0	54	0	1
Minneapolis	425,435	67	11	30	0	1	21	0	7
St. Paul	246,001	12	12	10	0	1	185	2	4
Iowa:									
Davenport	(1)	6	0	0	0	0	1	0	—
Des Moines	(1)	0	1	0	0	0	0	0	—
Sioux City	(1)	0	1	0	0	0	7	0	—
Waterloo	36,771	1	0	0	0	0	26	0	—
Missouri:									
Kansas City	367,481	2	4	0	1	1	21	0	2
St. Joseph	78,342	1	1	0	0	0	5	0	0
St. Louis	821,543	9	28	50	0	0	113	2	—
North Dakota:									
Fargo	26,403	1	0	0	0	0	0	5	0
Grand Forks	14,811	—	0	—	—	—	—	—	—
South Dakota:									
Aberdeen	15,036	0	0	0	0	0	3	1	—
Sioux Falls	30,127	0	0	3	0	0	3	0	0
Nebraska:									
Lincoln	60,941	4	1	0	0	0	1	1	0
Omaha	211,768	7	2	0	0	0	31	0	7
Kansas:									
Topeka	55,411	10	1	0	0	0	1	0	0
Wichita	88,367	1	0	2	0	0	3	0	0
<b>SOUTH ATLANTIC</b>									
Delaware:									
Wilmington	122,049	1	1	0	0	0	5	0	1
Maryland:									
Baltimore	796,296	39	13	9	2	2	18	45	18
Cumberland	33,741	1	0	1	0	0	1	0	1
Frederick	12,035	0	0	0	0	0	0	0	0
District of Columbia:									
Washington	497,906	15	5	8	0	0	90	0	9
Virginia:									
Lynchburg	30,395	3	0	0	0	0	21	0	0
Norfolk	(1)	9	0	0	0	0	21	0	1
Richmond	186,403	6	2	3	0	1	112	0	4
Roanoke	58,208	0	1	0	0	0	4	0	3
West Virginia:									
Charleston	49,619	1	1	0	1	0	10	0	3
Huntington	63,485	0	0	0	0	1	0	0	2
Wheeling	56,208	3	0	1	0	0	26	0	2
North Carolina:									
Raleigh	30,371	4	0	0	0	0	0	0	1
Wilmington	37,061	0	0	1	0	0	2	0	0
Winston-Salem	69,031	6	1	0	0	0	19	1	0

<sup>1</sup> No estimate made.

## City reports for week ended June 26, 1926—Continued

Division, State, and city	Population July 1, 1925, estimated	Chick-en pox, cases re-ported	Diphtheria		Influenza		Meas-les, cases re-ported	Mumps, cases re-ported	Pneu-monia, deaths re-ported
			Cases es-ti-mated ex-pectancy	Cases re-ported	Cases re-ported	Deaths re-ported			
<b>SOUTH ATLANTIC—CON.</b>									
South Carolina:									
Charleston	73,125	0	0	0	5	0	0	0	0
Columbia	41,225	7	0	0	0	0	0	0	0
Greenville	27,311	0	0	0	0	0	0	0	1
Georgia:									
Atlanta	(1)	4	1	0	1	0	35	1	5
Brunswick	16,800	0	0	0	0	0	8	0	0
Savannah	93,134	1	0	0	0	0	0	0	0
Florida:									
Miami	69,754	1	—	0	0	0	2	1	1
St. Petersburg	26,847	0	0	0	0	0	0	0	0
Tampa	94,743	0	0	1	0	0	1	0	1
<b>EAST SOUTH CENTRAL</b>									
Kentucky:									
Covington	58,309	0	1	0	0	0	2	0	1
Louisville	305,935	4	3	1	0	0	6	0	8
Tennessee:									
Memphis	174,533	2	1	0	0	0	50	1	7
Nashville	136,220	1	0	0	0	0	4	0	1
Alabama:									
Birmingham	205,670	3	1	1	2	1	48	2	6
Mobile	65,955	0	0	0	0	0	0	0	1
Montgomery	46,481	0	0	0	0	0	8	0	0
<b>WEST SOUTH CENTRAL</b>									
Arkansas:									
Fort Smith	31,643	0	0	0	0	—	1	0	—
Little Rock	74,216	2	0	0	0	—	12	0	—
Louisiana:									
New Orleans	414,493	1	5	4	4	3	4	0	6
Shreveport	57,857	0	0	0	0	0	0	0	1
Oklahoma:									
Oklahoma City	(1)	1	0	0	0	0	0	0	1
Texas:									
Dallas	194,450	5	2	3	2	2	0	2	2
Galveston	48,375	0	0	0	0	0	0	0	0
Houston	164,954	0	1	1	0	0	0	0	0
San Antonio	198,069	0	1	2	0	0	5	0	5
<b>MOUNTAIN</b>									
Montana:									
Billings	17,971	3	0	0	0	0	1	0	1
Great Falls	29,883	2	0	3	0	0	33	0	0
Helena	12,037	0	0	1	0	0	0	0	2
Missoula	12,668	0	0	1	0	0	0	2	0
Idaho:									
Boise	23,042	0	0	1	0	0	2	1	0
Colorado:									
Denver	280,911	27	10	3	—	—	30	1	5
Pueblo	43,787	3	2	1	0	0	17	0	0
New Mexico:									
Albuquerque	21,000	1	1	0	0	0	0	0	0
Utah:									
Salt Lake City	130,948	5	3	3	0	0	4	5	3
Nevada:									
Reno	12,665	0	0	0	0	0	0	0	1
<b>PACIFIC</b>									
Washington:									
Seattle	(1)	15	5	0	0	—	44	13	—
Spokane	108,897	19	2	2	0	—	32	0	—
Tacoma	104,455	6	2	3	0	0	8	0	0
Oregon:									
Portland	282,383	12	5	9	0	0	54	5	3
California:									
Los Angeles	(1)	27	36	33	1	0	10	8	9
Sacramento	72,260	2	2	2	0	0	2	1	2
San Francisco	557,530	13	17	9	0	0	84	5	3

<sup>1</sup> No estimate made.

## City reports for week ended June 26, 1926—Continued

Division, State, and city	Scarlet fever		Smallpox			Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported	Tuberculosis, deaths reported	Cases, estimated expectancy	Cases reported	Deaths reported	
<b>NEW ENGLAND</b>										
Maine:										
Portland	1	1	0	0	0	0	1	0	0	14
New Hampshire:										
Concord	0	3	0	0	0	0	0	0	0	4
Manchester	1	1	0	0	0	0	0	0	0	24
Nashua	0	1	0	0	0	1	0	0	0	6
Vermont:										
Barre	0	0	0	0	0	0	0	0	0	5
Massachusetts:										
Boston	28	60	0	0	0	12	3	2	0	177
Fall River	1	5	0	0	0	3	3	0	0	4
Springfield	3	3	0	0	0	3	0	0	0	28
Worcester	4	6	0	0	0	5	0	0	0	52
Rhode Island:										
Pawtucket	0	1	0	0	0	0	0	0	0	13
Providence	4	2	0	0	0	4	0	1	0	67
Connecticut:										
Bridgeport	4	10	0	0	0	3	1	0	0	31
Hartford	3	2	0	0	0	4	1	0	0	40
New Haven	2	7	0	0	0	2	1	0	0	34
<b>MIDDLE ATLANTIC</b>										
New York:										
Buffalo	15	9	0	0	0	13	1	2	0	34
New York	105	267	0	0	0	117	16	8	0	74
Rochester	8	10	0	0	0	5	0	2	0	72
Syracuse	6	0	0	0	0	4	0	0	0	45
New Jersey:										
Camden	2	6	0	0	0	2	0	1	0	27
Newark	12	31	0	1	0	15	0	0	0	29
Trenton	1	5	1	0	0	1	1	2	0	29
Pennsylvania:										
Philadelphia	46	69	1	0	0	41	5	2	0	46
Pittsburgh	15	23	0	0	0	9	2	0	0	94
Reading	1	2	0	0	0	0	0	3	0	6
<b>EAST NORTH CENTRAL</b>										
Ohio:										
Cincinnati	5	16	2	0	0	10	1	1	0	17
Cleveland	13	69	2	0	0	14	2	0	0	98
Columbus	3	28	1	0	0	6	1	0	0	54
Toledo	9	11	1	0	0	3	1	0	0	68
Indiana:										
Fort Wayne	1	1	1	2	0	0	0	0	0	39
Indianapolis	6	10	4	16	0	4	0	2	0	64
South Bend	1	0	1	0	0	0	0	0	0	8
Terre Haute	1	0	1	0	0	0	0	0	0	10
Illinois:										
Chicago	64	81	2	3	0	46	3	2	0	40
Peoria	1	2	0	0	0	1	0	0	0	1
Springfield	1	1	1	0	0	0	0	0	0	7
Michigan:										
Detroit	44	116	5	0	0	30	3	0	0	59
Flint	2	16	1	0	0	2	0	0	0	17
Grand Rapids	3	10	0	0	0	2	0	0	0	3
Wisconsin:										
Kenosha	1	0	1	0	0	0	0	0	0	2
Madison	1	3	0	0	0	0	0	0	0	15
Milwaukee	18	16	4	0	0	3	1	1	0	67
Racine	2	4	1	0	0	1	0	0	0	13
Superior	1	0	2	0	0	2	0	0	0	11
<b>WEST NORTH CENTRAL</b>										
Minnesota:										
Duluth	2	18	3	0	0	0	0	0	0	18
Minneapolis	16	49	7	0	0	2	1	2	0	78
St. Paul	11	14	2	1	0	3	1	0	0	59

<sup>1</sup> Pulmonary tuberculosis only.

## City reports for week ended June 28, 1926—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber-cu-losis, deaths re-ported	Typhoid fever			Whoop-ing cough, cases re-ported	Deaths, all causes
	Cases, es-ti-mated ex-pectancy	Cases re-ported	Cases, es-ti-mated ex-pectancy	Cases re-ported	Deaths re-ported		Cases, es-ti-mated ex-pectancy	Cases re-ported	Deaths re-ported		
<b>WEST NORTH CENTRAL—CON.</b>											
Iowa:											
Davenport	0	2	2	0			0	0			0
Des Moines	3	0	3	1			0	0			0
Sioux City	1	13	2	5			0	0			4
Waterloo	1	0	1	0			0	0			6
Missouri:											
Kansas City	3	7	3	0	0	6	1	0	0	7	79
St. Joseph	0	1	0	0	0	3	0	0	0	2	43
St. Louis	14	56	1	6	0	9	3	0	0	47	174
North Dakota:											
Fargo	1	1	0	0	0	0	0	0	0		12
Grand Forks	0	0					0				
South Dakota:											
Aberdeen	1	2	0	0			0	0		6	
Sioux Falls	0	1	1	0	0	0	0	0	0	0	4
Nebraska:											
Lincoln	1	1	0	1	0	1	0	0	0	7	12
Omaha	2	15	4	10	0	3	1	0	0	2	42
Kansas:											
Topeka	1	1	1	0	0	1	1	0	0	0	6
Wichita	1	2	3	0	0	1	0	0	0	8	20
<b>SOUTH ATLANTIC</b>											
Delaware:											
Wilmington	3	3	0	0	0	0	0	1	0	2	22
Maryland:											
Baltimore	12	49	0	0	0	20	3	3	1	45	225
Cumberland	0	0	0	0	0	0	1	0	0	0	9
Frederick	0	0	0	0	0	0	0	0	0	0	2
District of Columbia:											
Washington	8	15	0	1	0	13	2	0	0	24	134
Virginia:											
Lynchburg	1	1	1	0	0	0	1	0	0	9	11
Norfolk	0	3	0	0	0	4	1	0	0	22	
Richmond	1	3	1	0	0	2	1	3	1	2	57
Roanoke	0	0	0	5	0	1	1	0	0	0	11
West Virginia:											
Charleston	1	1	1	0	0	0	1	0	0	9	26
Huntington	0	0	0	0	0	0	1	0	0	0	20
Wheeling	1	3	0	0	0	0	1	0	0	0	14
North Carolina:											
Raleigh	0	0	0	0	0	3	1	0	0	9	15
Wilmington	0	1	0	0	0	1	0	0	0	10	10
Winston-Salem	0	1	1	1	0	0	1	0	0	7	15
South Carolina:											
Charleston	0	0	1	4	0	2	1	4	0	2	31
Columbia	0	0	1	0	0	0	1	2	0	0	
Greenville	0	0	1	0	0	0	1	1	0	2	8
Georgia:											
Atlanta	3	1	5	2	0	6	3		3	2	73
Brunswick	0	0	0	0	0	3	1	0	0	0	3
Savannah	0	0	0	0	0	4	2	0	0	0	31
Florida:											
Miami	0	0	0	0	2	0	3	0	0	32	47
St. Petersburg	0	0	1	0	1	0	0	0	0	0	8
Tampa	0	0	0	1	0	0	1	2	0	0	28
<b>EAST SOUTH CENTRAL</b>											
Kentucky:											
Covington	0	0	1	0	0	2	1	0	0	0	13
Louisville	2	5	0	0	0	5	2	3	0	0	78
Tennessee:											
Memphis	1	2	1	13	0	12	3	0	0	9	85
Nashville	1	0	1	1	0	5	3	2	0	5	52
Alabama:											
Birmingham	1	1	2	2	0	9	3	0	0	28	84
Mobile	1	0	1	0	0	0	1	2	0	1	22
Montgomery	1	1	0	1	0	0	1	0	0	0	19

## City reports for week ended June 26, 1926—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber-cu-losis, deaths re-ported	Typhoid fever			Whoop-ing cough, cases re-ported	Deaths, all causes
	Cases, es-ti-mated ex-pectancy	Cases re-re-ported	Cases, es-ti-mated ex-pectancy	Cases re-re-ported	Deaths re-re-ported		Cases, es-ti-mated ex-pectancy	Cases re-re-ported	Deaths re-re-ported		
<b>WEST SOUTH CENTRAL</b>											
Arkansas:											
Fort Smith	1	0	0	0	0	0	0	0	0	4	4
Little Rock	0	0	0	0	0	1	1	0	0	2	2
Louisiana:											
New Orleans	2	2	1	0	0	13	5	2	0	7	136
Shreveport	0	1	1	0	0	0	2	1	0	0	21
Oklahoma:											
O k l a h o m a City	0	0	3	0	0	1	1	0	0	0	22
Texas:											
Dallas	2	4	1	1	0	1	2	1	1	10	44
Galveston	0	0	0	0	0	0	0	0	0	0	6
Houston	1	0	0	2	0	6	1	1	0	1	57
San Antonio	0	0	0	1	0	6	1	2	0	0	51
<b>MOUNTAIN</b>											
Montana:											
Billings	0	5	0	0	0	0	0	0	0	0	5
Great Falls	2	0	1	0	0	1	0	0	0	0	2
Helena	0	0	0	0	0	0	0	0	0	0	3
Missoula	0	0	0	0	0	0	0	0	0	0	4
Idaho:											
Boise	0	0	1	1	0	0	0	0	0	0	5
Colorado:											
Denver	7	4	0	0	0	9	1	0	0	23	54
Pueblo	1	0	0	0	0	2	0	0	0	0	13
New Mexico:											
Utah:											
Albuquerque	0	1	0	0	0	3	0	0	0	2	15
Nevada:											
Salt Lake City	2	4	1	0	0	0	0	0	0	52	25
Reno	0	0	0	1	0	0	0	0	0	0	3
<b>PACIFIC</b>											
Washington:											
Seattle	8	10	3	0	0	1	0	0	0	4	4
Spokane	3	8	3	0	0	0	0	0	0	3	3
Tacoma	2	2	2	6	0	1	0	0	0	2	18
Oregon:											
Portland	5	17	6	6	0	3	1	2	0	2	56
California:											
Los Angeles	14	29	3	5	0	21	3	6	0	2	198
Sacramento	1	3	0	1	0	1	1	0	0	0	22
San Francisco	11	7	1	0	0	14	1	0	1	1	124

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Polio-myelitis (infan-tile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, es-ti-mated ex-pectancy	Cases	Deaths
<b>NEW ENGLAND</b>									
Maine:									
Portland	0	0	0	0	0	0	0	1	0
Massachusetts:									
Boston	0	0	2	0	0	0	0	0	0
Connecticut:									
Bridgeport	0	0	1	0	0	0	0	0	0

## City reports for week ended June 26, 1926—Continued

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
<b>MIDDLE ATLANTIC</b>									
New York:									
Buffalo.....	0	0	0	1	0	0	0	0	0
New York <sup>1</sup> .....	0	1	6	0	0	0	2	1	0
New Jersey:									
Newark.....	2	0	0	0	0	0	1	0	0
Trenton.....	0	0	0	1	0	0	0	0	0
Pennsylvania:									
Philadelphia.....	0	0	0	2	0	0	0	0	0
Pittsburgh.....	0	1	0	0	0	0	0	0	0
<b>EAST NORTH CENTRAL</b>									
Ohio:									
Cleveland.....	0	0	1	0	0	0	1	0	0
Columbus.....	0	0	0	1	0	0	0	0	1
Toledo.....	0	0	0	0	0	0	0	1	1
Illinois:									
Chicago.....	1	0	0	1	0	0	0	0	0
Michigan:									
Detroit.....	0	0	0	1	0	0	1	0	0
<b>WEST NORTH CENTRAL</b>									
Minnesota:									
Minneapolis.....	0	0	1	0	0	0	0	0	0
<b>SOUTH ATLANTIC</b>									
Maryland:									
Baltimore <sup>1</sup> .....	1	1	0	0	0	0	1	0	0
District of Columbia:									
Washington.....	0	0	0	0	1	0	0	0	0
South Carolina:									
Charleston.....	0	0	0	0	12	1	0	0	0
Georgia:									
Savannah.....	0	0	0	0	0	1	0	0	0
<b>EAST SOUTH CENTRAL</b>									
Alabama:									
Birmingham.....	0	0	0	0	1	0	1	0	0
Mobile.....	0	0	1	0	0	0	0	1	1
Montgomery.....	0	0	0	0	1	0	0	0	0
<b>WEST SOUTH CENTRAL</b>									
Arkansas:									
Little Rock.....	0	1	0	0	0	2	0	0	0
Louisiana:									
New Orleans.....	0	0	0	0	1	1	0	0	0
Shreveport.....	0	0	0	0	0	1	0	0	0
Texas:									
Dallas.....	0	0	0	0	0	0	0	1	1
<b>PACIFIC</b>									
Oregon:									
Portland.....	0	1	0	0	0	0	0	0	0
California:									
Los Angeles <sup>2</sup> .....	2	0	0	0	1	0	0	0	0
San Francisco.....	0	0	0	0	1	0	0	0	0

<sup>1</sup> Typhus fever: 1 case New York City; 1 case Baltimore, Md.<sup>2</sup> Rabies in man; 1 death Los Angeles, Calif.

The following table gives the rates per 100,000 population for 103 cities for the five-week period ending June 26, 1926, compared with those for a like period ended June 27, 1925. The population figures used in computing the rates are approximate estimates as of July 1,

1925 and 1926, respectively, authoritative figures for many of the cities not being available. The 103 cities reporting cases had an estimated aggregate population of nearly 30,000,000 in 1925 and nearly 30,500,000 in 1926. The 96 cities reporting deaths had more than 29,250,000 estimated population in 1925 and more than 29,750,000 in 1926. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

*Summary of weekly reports from cities, May 23 to June 26, 1926—Annual rates per 100,000 population—Compared with rates for the corresponding period of 1925<sup>1</sup>*

DIPHTHERIA CASE RATES

	Week ended									
	May 30, 1925	May 29, 1926	June 6, 1925	June 5, 1926	June 13, 1925	June 12, 1926	June 20, 1925	June 19, 1926	June 27, 1925	June 26, 1926
166 cities	144	122	152	117	116	136	114	113	112	131
New England	110	80	125	78	91	69	93	78	122	59
Middle Atlantic	210	145	243	134	155	155	166	124	163	152
East North Central	100	108	92	119	89	146	86	131	78	161
West North Central	187	163	183	207	141	231	129	167	111	195
South Atlantic	72	96	88	47	54	60	48	66	69	45
East South Central	11	42	11	16	11	26	5	16	32	10
West South Central	62	65	40	56	66	47	70	43	44	43
Mountain	139	127	74	109	176	127	185	146	102	118
Pacific	160	159	138	132	157	159	108	94	102	132

MEASLES CASE RATES

103 cities	569	1,283	694	1,014	558	928	416	732	292	617
New England	836	1,064	841	728	860	659	611	494	393	425
Middle Atlantic	701	956	771	751	724	707	542	585	380	476
East North Central	839	1,252	825	1,103	779	1,018	547	943	377	828
West North Central	137	1,061	111	2,209	131	2,038	84	1,260	58	935
South Atlantic	242	1,542	363	1,213	280	1,103	330	788	263	701
East South Central	200	2,376	121	1,660	194	1,396	105	695	121	612
West South Central	13	112	22	86	13	125	18	77	4	95
Mountain	240	1,302	37	1,247	92	919	74	701	92	792
Pacific	157	808	157	696	83	593	80	602	50	485

SCARLET FEVER CASE RATES

103 cities	267	274	256	231	170	261	159	233	113	212
New England	204	258	256	248	173	255	137	203	103	236
Middle Atlantic	270	212	262	209	155	195	144	221	99	210
East North Central	321	339	293	247	198	333	202	340	146	233
West North Central	514	695	466	416	315	621	317	480	179	354
South Atlantic	115	160	125	190	58	160	58	131	42	152
East South Central	168	171	116	195	147	78	147	47	84	47
West South Central	62	116	84	163	44	86	35	69	53	30
Mountain	398	100	324	218	268	118	139	127	203	118
Pacific	133	181	144	170	155	237	110	220	102	159

<sup>1</sup> The figures given in this table are rates per 100,000 population, annual basis—and not the number of cases reported. Populations used are estimated as of July 1, 1925 and 1926, respectively.

<sup>2</sup> Charleston, W. Va., not included.

<sup>3</sup> Grand Forks, N. Dak., not included.

<sup>4</sup> Wilmington, N. C., not included.

<sup>5</sup> Grand Forks, N. Dak., Lynchburg, Va., and Tacoma, Wash., not included.

<sup>6</sup> Lynchburg, Va., not included.

<sup>7</sup> Tacoma, Wash., not included.

July 16, 1926

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Summary of weekly reports from cities, May 23 to June 26, 1926—Annual rates per 100,000 population—Compared with rates for the corresponding period of 1925—Continued

## SMALLPOX CASE RATES

	Week ended									
	May 30, 1925	May 29, 1926	June 6, 1925	June 5, 1926	June 13, 1925	June 12, 1926	June 20, 1925	June 19, 1926	June 27, 1925	June 26, 1926
103 cities.....	147	19	45	15	36	16	35	11	24	16
New England.....	0	0	0	0	0	0	0	0	0	0
Middle Atlantic.....	2	1	4	0	2	0	1	0	0	0
East North Central.....	54	13	61	9	40	12	42	10	19	14
West North Central.....	68	144	92	40	50	28	58	32	36	44
South Atlantic.....	10	26	37	34	21	38	29	30	13	26
East South Central.....	389	62	105	83	273	52	184	10	121	88
West South Central.....	53	99	31	43	4	34	18	26	6	17
Mountain.....	55	36	37	27	28	46	18	27	28	18
Pacific.....	160	82	182	24	141	54	146	20	163	32

## TYPHOID FEVER CASE RATES

103 cities.....	* 15	* 10	* 24	* 9	27	* 12	21	* 11	25	* 12
	15	10	24	9	27	12	21	11	25	12
New England.....	17	7	29	0	24	17	19	19	17	9
Middle Atlantic.....	9	5	26	9	17	6	14	9	18	10
East North Central.....	7	9	9	5	9	4	6	4	8	4
West North Central.....	10	14	8	18	24	16	12	10	10	4
South Atlantic.....	29	26	39	32	61	26	46	25	67	30
East South Central.....	47	31	37	10	110	57	74	21	84	36
West South Central.....	62	13	84	9	110	52	123	30	128	39
Mountain.....	9	0	74	9	46	9	37	0	0	0
Pacific.....	8	11	8	8	14	13	6	9	19	16

## INFLUENZA DEATH RATES

96 cities.....	* 12	12	* 10	8	7	10	6	* 7	6	5
	12	12	10	8	7	10	6	7	6	5
New England.....	7	9	2	2	5	12	2	9	7	0
Middle Atlantic.....	9	11	11	6	6	9	4	9	6	6
East North Central.....	13	11	10	3	6	10	7	3	6	3
West North Central.....	17	13	4	8	8	4	6	4	4	6
South Atlantic.....	12	11	6	3	4	5	6	4	2	6
East South Central.....	37	26	47	36	16	36	32	16	16	5
West South Central.....	29	9	5	14	19	19	10	24	10	24
Mountain.....	0	9	28	18	9	9	0	0	9	0
Pacific.....	7	11	11	4	4	0	4	4	4	0

## PNEUMONIA DEATH RATES

96 cities.....	* 110	120	* 123	* 105	99	95	78	* 87	65	74
	110	120	123	105	99	95	78	87	65	74
New England.....	110	123	69	116	113	102	60	87	58	69
Middle Atlantic.....	145	145	167	190	139	169	93	95	75	83
East North Central.....	111	106	107	98	79	87	76	74	45	61
West North Central.....	87	83	55	50	57	58	32	75	51	44
South Atlantic.....	147	111	198	180	115	96	75	112	90	94
East South Central.....	158	171	116	125	68	125	95	99	110	125
West South Central.....	73	109	63	99	92	94	87	71	73	76
Mountain.....	74	91	62	146	102	82	139	100	55	109
Pacific.....	73	64	116	67	44	67	58	75	47	43

\* Charleston, W. Va., not included.

\* Grand Forks, N. Dak., not included.

\* Wilmington, N. C., not included.

\* Grand Forks, N. Dak., Lynchburg, Va., and Tacoma, Wash., not included.

\* Lynchburg, Va., not included.

\* Tacoma, Wash., not included.

*Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1925 and 1926, respectively*

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1925	1926	1925	1926
<b>Total</b>	<b>103</b>	<b>96</b>	<b>29,944,996</b>	<b>30,473,129</b>	<b>29,251,638</b>	<b>29,764,201</b>
New England	12	12	2,176,124	2,206,124	2,176,124	2,206,124
Middle Atlantic	10	10	10,346,970	10,476,970	10,346,970	10,476,970
East North Central	16	16	7,481,656	7,655,436	7,481,656	7,655,436
West North Central	14	11	2,594,962	2,634,662	2,461,380	2,499,036
South Atlantic	21	21	2,716,070	2,776,070	2,716,070	2,776,070
East South Central	7	7	993,103	1,004,953	993,103	1,004,953
West South Central	8	6	1,184,057	1,212,057	1,078,198	1,103,695
Mountain	9	9	563,912	572,773	563,912	572,773
Pacific	6	4	1,888,142	1,934,084	1,434,245	1,460,144

## FOREIGN AND INSULAR

### THE FAR EAST

*Report for week ended June 12, 1926.*—The following report for the week ended June 12, 1926, was transmitted by the Far Eastern Bureau of the Health Section of the League of Nations' Secretariat, located at Singapore, to the headquarters at Geneva:

Maritime towns	Plague						Cholera						Small-pox					
	Cases		Deaths		Cases		Deaths		Cases		Deaths		Cases		Deaths		Cases	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Egypt: Suez.....	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iraq: Basrah.....	0	0	0	0	1	1	0	0	103	73	0	0	0	0	0	0	0	0
British India:																		
Calcutta.....	0	0	41	8	7	0	0	0	0	0	0	0	0	0	0	0	0	0
Bombay.....	4	0	0	34	18	0	0	0	0	0	0	0	0	0	0	0	0	0
Madras.....	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Karachi.....	6	0	0	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Negapatam.....	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Siam: Bangkok.....	0	0	116	50	4	4	0	0	0	0	0	0	0	0	0	0	3	1
Hongkong.....	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	1	0
French Indo-China:																		
Saigon and Cholon.....	0	0	19	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Haiphong.....	0	0	103	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0
China: Amoy.....	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Japan:																		
Simonoseki.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Osaka.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Kwantung:																		
Dairen.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
Port Arthur.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Telegraphic reports from the following maritime towns indicated that no case of plague, cholera, or smallpox was reported during the week:

#### ASIA

*British India.*—Chittagong, Cochin, Tuticorin, Vizagapatam.

*Federated Malay States.*—Port Swettenham.

*Straits Settlements.*—Penang, Singapore.

*Sarawak.*—Kuching.

*British North Borneo.*—Sandakan.

*Portuguese Timor.*—Dilly.

*Philippine Islands.*—Manila, Iloilo, Jolo, Cebu, Zamboanga.

*French Indo-China.*—Turane.

*China.*—Shanghai.

*Formosa.*—Keelung.

*Japan.*—Nagasaki, Yokohama, Moji, Kobe, Niigata, Tsuruga, Hakodate.

*Korea.*—Chemulpo, Fusan.

*Manchuria.*—Antung, Mukden, Changchun, Harbin.

*U. S. S. R.*—Vladivostok.

#### AUSTRALASIA AND OCEANIA

*Australia.*—Adelaide, Melbourne, Sydney, Brisbane, Rockhampton, Townsville, Port Darwin, Broome, Fremantle, Carnarvon, Thursday Island.

*New Guinea.*—Port Moresby.

*New Zealand.*—Auckland, Wellington, Christchurch, Invercargill, Dunedin.

*New Caledonia.*—Noumea.

*Hawaii.*—Honolulu.

## AFRICA

*Egypt*.—Alexandria, Port Said.*Anglo-Egyptian Sudan*.—Port Sudan.*Eritrea*.—Massaua.*French Somaliland*.—Jibuti.*British Somaliland*.—Berbera.*Italian Somaliland*.—Magadiscio.*Kenya*.—Mombasa.*Tanganyika*.—Dar-es-Salaam.*Seychelles*.—Victoria.*Mauritius*.—Port Louis.*Portuguese East Africa*.—Mozambique, Beira, Lourenço, Marques.*Union of South Africa*.—Durban, East London, Port Elizabeth, Cape Town.

Reports had not been received in time for distribution from—

*British India*.—Rangoon.*Dutch East Indies*.—Batavia, Surabaya, Samarang, Cherikon, Belawan, Deli, Palembang, Sabang, Makassar, Menado, Banjermasin, Balik-Papan, Tarakan, Pontianak, Padang.*Madagascar*.—Tamatave, Majunga.*Zanzibar*.—Zanzibar.

## CHOLERA ON VESSEL

*Steamship "Kola"*—*In Gulf of Siam*.—Under date of May 20, 1926, information was received of the occurrence of two cases of cholera, both fatal, on the steamship *Kola* en route to Koh Phra quarantine station, Siam. The cases occurred in the persons of the captain and chief engineer of the *Kola*, and developed when the vessel was entering the Gulf of Siam.

## CANADA

*Communicable diseases—Week ended June 19, 1926, and week ended June 26, 1926*.—The Canadian Ministry of Health reports certain communicable diseases in five provinces of Canada for week ended June 19, and in seven Provinces for week ended June 26, 1926, as follows:

WEEK ENDED JUNE 19, 1926

Disease	Nova Scotia	New Brunswick <sup>1</sup>	Quebec	Ontario	Manitoba	Saskatchewan	Alberta <sup>1</sup>	Total
Influenza	1							1
Lethargic encephalitis				1				1
Poliomyelitis							1	1
Smallpox						9		16
Typhoid fever	4		9	11	3	3		30

WEEK ENDED JUNE 26, 1926

Cerebrospinal fever		2	2	1				5
Influenza	23							23
Poliomyelitis				2				2
Smallpox				6	2			8
Typhoid fever	1	2	2	1	2	1		14

<sup>1</sup> No report for the week ended June 19, 1926.

*Measles—Edmonton (Alberta)—April—May, 1926.*—During the month of April, 1926, 1,012 cases of measles with 4 deaths were reported at Edmonton, Alberta, Canada, and during the month of May, 1926, 578 cases with 1 death.

#### ECUADOR

*Plague—Guayaquil—May 16—June 15, 1926.*—Plague has been reported at Guayaquil, Ecuador, as follows: May 16—31, 1926, four cases; June 1—15, 1926, one case.

*Plague-infected rats.*—Period May 16—31, 1926—11,110 rats taken, 12 rats found plague infected; June 1—15, 1926—9,767 rats taken, 6 rats found infected.

#### EGYPT

*Plague—May 29—June 3, 1926—Summary.*—During the week ended June 3, 1926, 8 cases of plague were reported in Egypt, of which 2 cases occurred in the city of Suez. The total number of cases reported from January 1 to June 3, 1926, was 51, as compared with 57 during the corresponding period of 1925.

*Later occurrence.*—On June 8, two cases of bubonic plague with one death were reported at Suez, and on June 10 one death in hospital. In the Province of Beni-Suef, June 5 to 8, three cases of bubonic plague were reported.

#### PERU

*Plague—May, 1926.*—During the month of May, 1926, 23 cases of plague with 10 deaths were reported in Peru. The reported occurrence was for the departments of Ica, Libertad, and Lima. In the departments of Ancash and Cajamarca plague was reported present during the period referred to. For further information relative to locality of occurrence see page 1506.

#### SIAM

*Further relative to cholera—Bangkok.*—Epidemic cholera was reported present at Bangkok, Siam, from October 4 to December 26, 1925, with 431 cases and 258 deaths, and from December 27, 1925, to March 13, 1926, with 386 cases and 249 deaths.<sup>1</sup> Under date of May 14, 1926, there were reported for the period March 14 to May 8, 1926, 964 cases of cholera with 587 deaths.

*Inoculation against cholera.*—It was stated under date of May 15, 1926, that free inoculations against cholera were administered at the Pasteur Institute of Bangkok to all persons applying and that in the registration area of Bangkok 5,538 persons were inoculated during the week ended May 1 and 1,508 during the week ended May 8.

<sup>1</sup> Public Health Reports, May 21, 1926, p. 1013.

1926; also that placards had been publicly posted urging the people not to drink canal water.

**Hospitalization.**—Hospital accommodations were stated to be insufficient and cholera patients were being treated at general hospital or at their homes. Water from the city supply was supplied by water boats to sections of the city where a shortage of water was reported.

*General distribution of cholera in Siam—April 1-May 8, 1926.*—During the period May 2 to 8, 1926, 698 cases of cholera with 463 deaths, were reported in Siam, and from April 1 to May 8, 2,116 cases with 1,431 deaths, occurring in 28 towns.

#### TUNISIA

*Further relative to plague—Kairouan.*<sup>2</sup>—Under date of June 11, 1926, the outbreak of plague reported in the vicinity of Kairouan, Tunisia, during the last weeks in May, 1926, was reported still present, with a few new cases occurring in the initial contaminated district. On June 6, a second contaminated district was discovered, with 7 cases present, at a locality south of the railway and 13 kilometers distant from Kairouan. Two plague deaths have been reported, one occurring near Sfax and one in Somra des Souassi. In both, the infection was stated to have originated at Zlass. No spread from these fatal cases was reported.

#### UNION OF SOUTH AFRICA

*Plague—May 16-22, 1926.*—During the week ended May 22, 1926, plague was reported in the Union of South Africa in the Cape Colony in Middleburg district, with the death of the case, European reported during the previous week<sup>2</sup> at Sakfontein, and two new cases—European, one; native, one—occurring on the same farm, the type of the disease in both cases being pneumonic. In the Orange Free State two new fatal cases occurring in natives were reported at Protestpan, in Hoopstad district, 15 miles from Bultfontein.<sup>2</sup>

*Typhus fever.*—Sporadic cases have been reported during the period referred to, one at Orange, East London district, Cape Province, one at Quibcer, Victoria East, and one at Mossel Bay.

<sup>2</sup> Public Health Reports, July 9, 1926, p. 1457.

## CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

The reports contained in the following tables must not be considered as complete or final as regards either the lists of countries included or the figures for the particular countries for which reports are given.

Reports Received During Week Ended July 16, 1926 <sup>1</sup>

## CHOLERA

Place	Date	Cases	Deaths	Remarks
Ceylon				Apr. 18-May 1, 1926: Cases, 30; deaths, 24.
French Settlements in India				Mar. 7-Apr. 10, 1926: Cases, 13; deaths, 13.
India				May 2-8, 1926: Cases, 2,805; deaths, 1,715. May 9-15, 1926: Cases, 2,683; deaths, 1,488.
Madras	May 30-June 5	1	1	
Rangoon	May 16-29	13	12	
Indo-China				Report covers Saigon and Cholon.
Saigon	May 9-15	32	30	
Philippine Islands				
Manila	May 18-24	2	2	
Provinces				
Albay	Apr. 18-24	1	1	
Mindoro	Feb. 21-27	1	1	
Siam				
Bangkok	May 16-22	282	192	

## PLAQUE

Azores:				
St. Michaels:				
Arriales	May 9-15	1		
Livramento	May 15-29	2	1	
China:				
Amoy	May 1-29		30	Stated to be quite prevalent in city of Amoy.
Nanking	May 24-June 5			Prevalent.
Ecuador:				
Guayaquil	May 16-31	4		Rats taken: May 16-31, 1926, 11,110; found infected, 12.
Do.	June 1-15	1		Rats taken: June 1-15, 1926, 9,767; found infected, 6.
Egypt				
City—				
Suez	May 29-June 3	2		May 29-June 3, 1926: Cases, 8.
Do.	June 8-10	2	2	Jan. 1-June 3, 1926, cases, 51; corresponding period, 1925, cases, 57.
Province—				Bubonic.
Beni-Suef	June 5-8	3		Do.
India				May 2-8, 1926: Cases, 9,894; deaths, 8,026.
Bombay	May 16-22	4	5	
Karachi	May 30-June 5	3	3	
Madras Presidency	May 9-15	21	22	
Rangoon	May 23-29	1	1	
Iraq:				
Bagdad	do.	24	15	
Japan:				
Yokohama	Reported July 6		3	
Java:				
Batavia	May 15-21	18	18	
Nigeria				
Peru				
Departments—				
Ancash	May 1-31			Present.
Cajamarca	do.			Do.
Ica	do.	1		
Libertad	do.	4		
Lima	do.	18	10	Pacasmayo, cases, 2; Trujillo district, cases, 2.
Russia				Lima City, 1 case; country estates, 1.
Senegal				Jan. 19-Feb. 25, 1926: Cases, 7.
Straits Settlements:				Nov. 1-30, 1926: Cases, 3; deaths, 2.
Singapore	May 2-8	1	1	

<sup>1</sup> From medical officers of the Public Health Service, American consuls, and other sources.

## CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

## Reports Received During Week Ended July 16, 1926—Continued

## PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Union of South Africa				
Cape Colony	May 16-22	2	1	May 16-22, 1926: Cases, 4; deaths, 3.
Orange Free State				European 1, native 1, pneumonic; death of case, European, previously reported.
Hoopstad district—				
Protestpan	do	2	2	Locality 15 miles from Bultfontein. Previously reported infected.

## SMALLPOX

Canada:				
Manitoba	June 13-26	3		
Ontario	do	12		
Kingston	do	2		
Saskatchewan	June 13-19	9		
Chile:				
Antofagasta	June 6-12	1		
China:				
Amoy	May 1-29		8	
Chungking	May 16-29			Present.
Manchuria—				
An-shan	May 30-June 5	1		South Manchuria Ry.
do	3			Do.
Changchun	May 10-30	23	2	Do.
Dairen	May 30-June 5	1		Do.
Fushun	do	3		Do.
Kai-yuan	May 23-June 5			Present.
Nanking	May 16-29			Sporadic.
Swatow				
France	Mar. 1-31	68		
French Settlements in India	Mar. 7-Apr. 10	127	127	
Great Britain:				
Nottingham	May 30-June 5	1		
Sheffield	June 13-19	1		
India:				
Bombay	May 16-22	32	24	May 2-8, 1926: Cases, 6,700; deaths, 1,675. May 9-15, 1926: Cases, 7,478; deaths, 1,942.
Karachi	May 30-June 5	5	2	
Rangoon	May 16-29	4	1	
Indo-China:				
Saigon	May 9-15	1		Including Cholon.
Iraq:				
Bagdad	May 23-29	2		
Italy:				
Japan:				Mar. 28-Apr. 17, 1926: Cases, 10.
Kobe	May 30-June 5	1		
Java:				
Batavia	May 15-21	1		
East Java and Madoeira	May 2-8	3	1	Province.
Mexico:				
Aguascalientes	June 13-26	5		
San Luis Potosi	do	7		
Nigeria	Feb. 1-Mar. 31	270	12	
Poland	Mar. 28-May 1	12	1	
Russia:	Jan. 1-31	492		
Siam:				
Bangkok	May 16-22	6	3	
Tunisia	Apr. 1-May 10	6		

## TYPHUS FEVER

Bulgaria				
Chile:				Mar. 1-31, 1926: Cases, 37; deaths, 10.
Antofagasta	June 6-12	3		
Valparaiso	Apr. 29-May 5		1	
Chosen	Feb. 1-28	228	18	
Ireland:				
Cobh (Queenstown)	May 30-June 5	1		
Italy				Mar. 28-Apr. 17, 1926: Cases, 2.
Japan				Mar. 28-Apr. 10, 1926: Cases, 15.
Lithuania				Mar. 1-31, 1926: Cases, 38; deaths, 5.

## CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

## Reports Received During Week Ended July 16, 1926—Continued

## TYPHUS FEVER—Continued

Place	Date	Cases	Deaths	Remarks
Mexico:				
Mexico City	June 13-19	9	—	Including municipalities in the Federal District.
San Luis Potosi	June 13-26	—	—	Present, city and country.
Morocco	—	—	—	Mar. 1-31, 1926: Cases, 140.
Poland	—	—	—	May 2-8, 1926: Cases, 107; deaths, 7.
Rumania	—	—	—	Mar. 1-31, 1926: Cases, 41.
Russia	—	—	—	Jan. 1-31, 1926: Cases, 2,956.
Tunisia	—	—	—	Apr. 1-May 10, 1926: Cases, 64.
Yugoslavia:				
Zagreb	May 15-21	1	—	

Reports Received from June 26 to July 9, 1926<sup>1</sup>

## CHOLERA

Place	Date	Cases	Deaths	Remarks
India:				
Calcutta	Apr. 4-May 22	420	379	Apr. 25-May 1, 1926: Cases, 2,880; deaths, 1,943.
Madras	May 16-22	1	—	
Rangoon	May 9-15	5	1	
Indo-China:				
Saigon	May 2-8	20	18	
Siam:				
Bangkok	May 2-15	582	316	

## PLAQUE

China:				
Amoy	Apr. 18-May 1	—	—	Prevalent.
Nanking	May 9-22	—	—	Do.
Egypt:				
City—				
Suez	May 21-27	2	—	May 21-27, 1926: Cases, 4.
Do.	May 28-30	4	3	Jan. 1-May 27, 1926: Cases, 43.
Province—				
Beni-Suef	May 28-June 3	5	2	Bubonic, 1 case, 2 deaths; 1 case, 1 death, pneumonic.
Gharbieh	June 2	1	1	Bubonic.
Greece:				
Athens	Apr. 1-30	7	2	Including Piraeus.
Do.	May 1-31	9	2	Do.
Patras	May 27	2	1	
Zante	May 17	1	—	
India:				
Bombay	May 2-15	5	4	Apr. 25-May 1, 1926: Cases, 10,436; deaths, 8,214.
Karachi	May 23-29	1	1	
Madras Presidency	Apr. 25-May 1	16	13	
Rangoon	May 9-15	4	3	Plague-infected rats; January-April, 1926: 57.
Iraq:				
Bagdad	Apr. 18-May 15	83	56	
Java:				
Batavia	Apr. 24-May 7	21	21	
Cirebon	Apr. 11-24	3	3	
Madagascar:				
Moramanga Province	Apr. 1-15	2	2	Apr. 1-15, 1926: Cases, 42; deaths, 39.
Tananarive Province				Septicemic.
Tananarive Town	do	3	3	Pneumonic and septicemic.
Other localities	do	37	34	Bubonic, pneumonic, septicemic.
Tunisia:				
Kairouan	June 9	3	—	In territory 30 miles south of Kairouan, 9 cases.

<sup>1</sup> From medical officers of the Public Health Service, American consuls, and other sources. For reports received from Dec. 26, 1925, to June 25, 1926, see Public Health Reports for June 25, 1926. The tables of epidemic diseases are terminated semiannually and new tables begun.

July 16, 1926

## CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

## Reports Received from June 26 to July 9, 1926—Continued

## PLAQUE—Continued

Place	Date	Cases	Deaths	Remarks
Union of South Africa:				
Cape Province:				
Middelburg District	May 9-15	3	2	Ocurring on farm. In Europeans.
Orange Free State:				
Hoopstad district—				
Protestpan	do	1	1	In native. Locality 15 miles from Bultfontein.

## SMALLPOX

Algeria:				
Algiers	May 21-31	4		
Brazil:				
Para	May 16-29	6	7	
Rio de Janeiro	May 2-22	76	24	
Santos	Mar. 1-7	1		
Canada:				
Alberta	May 30-June 12	3		
Manitoba	do	12		
Winnipeg	June 6-12	5	1	
Ontario:				
Kingston	May 23-29	3		
North Bay	May 2-22	5		
Saskatchewan:				
China:				
Chungking	May 2-15			Present.
Feechow	May 9-22			Do.
Hongkong	May 2-15	4	3	
Manchuria:				
An-shan	May 16-22	1		South Manchuria Ry.
Antung	do	2		Do.
Changchun	do	2		Do.
Dairen	Apr. 26-May 9	31	6	
Fushun	May 16-22	3		Do.
Harbin	May 14-27	14		
Kai-yuan	do	1		Do.
Liao-ying	do	2		Do.
Muikden	do	1		Do.
Penhsihu	do	2		Do.
Teshihchiao	do	1		Do.
Wa-feng-tion	do	3		Do.
Nanking	May 8-22			Present.
Shanghai	May 2-22	7	24	Cases, foreign. Deaths, population of international concession, foreign and native.
Swatow	May 9-15			Sporadic.
Wanshein	May 1			Present among troops.
Egypt:				
Alexandria	May 15-31	5		
Great Britain:				
England:				
Bradford	May 23-29	1		
Newcastle-on-Tyne	June 6-12	1		
India:				
Bombay	May 2-15	56	24	Apr. 25-May 1, 1926: Cases, 6,675; deaths, 1,719.
Calcutta	Apr. 4-22	165	150	
Karachi	May 16-29	24	8	
Madras	do	5	3	
Rangoon	May 9-15	2	1	
Iraq:				
Bagdad	do	1		
Basra	Apr. 18-May 22	20	13	
Japan:				
Nagoya	May 16-22		1	
Taiwan Island	May 11-30	24		
Yokohama	May 2-8	2		
Java:				
East Java and Madoera	Apr. 11-May 1	18		
Malang	Apr. 4-10	6	1	Interior.
Latvia	Apr. 1-30	3		

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## CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

## Reports Received from June 26 to July 9, 1926—Continued

## SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Mexico:				
Guadalajara	June 8-14		2	
Mexico City	May 16-June 5	3		Including municipalities in Federal District.
San Antonio de Areiales	Jan. 1-June 30			
Tampico	June 1-10		2	
Torreón	May 1-31		10	
Poland:				
Portugal:				
Lisbon	Apr. 26-May 23		3	
Oporto	May 23-June 5	4		
Siam:				
Bangkok	May 2-15	2	5	
Straits Settlements:				
Singapore	Apr. 25-May 1	1		
Union of South Africa:				
Transvaal—				
Johannesburg	May 9-15	1		

## TYPHUS FEVER

Algeria:				
Algeria	May 21-31	2	1	
Chile:				
Antofagasta	May 23-29	3		
China:				
Ichang			1	Reported May 1, 1926. Occurring among troops.
Wanhien				Present among troops, May 1, 1926. Locality in Chungking consular district.
Ireland (Irish Free State):				
Cork	June 5	1		
Mexico:				
Mexico City	May 16-June 5	20		Including municipalities in Federal District.
Palestine				
Peru:				
Arequipa	Jan. 1-31		2	
Poland				
Union of South Africa				
Cape Province				
Do.	May 9-15			
Grahamstown	do	1		Sporadic.
Natal				Apr. 1-30, 1926: Cases, 4. Native.
Orange Free State				Apr. 1-30, 1926: Cases, 7. Native.
Transvaal				Apr. 1-30, 1926: Cases, 3; deaths, 3. Native.

## YELLOW FEVER

Brazil:				
Bahia	May 9-22	3	2	